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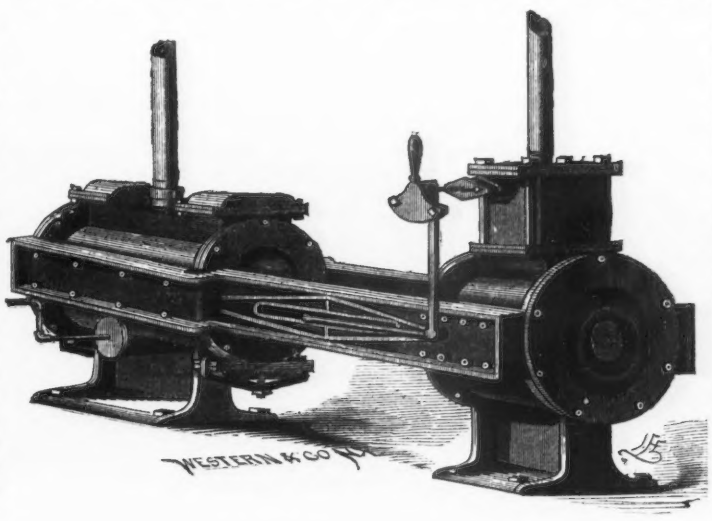
Vacuum Pump.

IT was a fortunate thought which suggested to Howard the idea of evaporating syrups and similar liquids in a vacuum. By this means the process may be carried on at a temperature greatly lower than that at which syrup boils in the open air, and consequently all the injurious changes caused by the action of heat on saccharine solutions are avoided, and the product is consequently more abundant and of better quality. Of late years, however, syrup is not the only article to the manufacture of which this principle has been applied. In the preparation of extracts of various dye-stuffs, and in the evaporation of various solutions which occur in chemical works, the removal of the superincumbent weight of the atmosphere is of great advantage. In devising the pump of which the accompanying engraving affords a very good general idea, the inventor, Mr. Charles B. Hardick, of No. 9. Adams street, Brooklyn, has kept steadily in view the importance of reducing this pressure to the very lowest possible point, and so well has he succeeded that, even in the ordinary large pumps used for practical every day work, the mercury in the barometer connected with the apparatus is maintained at a height which does not differ from that of the common barometer by more than half an inch. This result is attained by means of a device which completely removes what is known in air-pumps of the usual construction as the *dead space*, and transfers the duty of raising the valves from an elastic and easily compressible fluid to a liquid which, for all practical purposes, may be regarded as absolutely incompressible. To accomplish this, a small quantity of water is admitted to the end of the cylinder at each stroke. As the piston moves forward, this water is confined between the piston and the end of the cylinder, filling all cavities and raising up and ejecting the last traces of the air which was drawn from the vacuum-pan. Consequently, at the commencement of each stroke the pump-cylinder begins its work with a perfect vacuum, and not with a residuum of air remaining from the previous stroke. Another important point which is attained by the employment of water for the purpose of expelling the air is this: Before the air in the cylinder can raise the valve and pass out into the atmosphere, it must be condensed to such a degree of tension as will enable it to overcome not only the pressure of the atmosphere but the resistance of the valves. Consequently, the valves have hitherto been made so very light that they did not fit firmly in their seat. In this pump, as the matter to be ejected is water, no difficulty is found on this point. The water transmits, without the slightest diminution, the full pressure of the piston, and thus, while every trace of air is expelled, the valves may be of any required weight and strength, thus adding materially to their durability and efficiency. In addition to these points, the general arrangement of the pump is such as to render it very convenient and durable. The valves are easily reached by the removal of but two bolts for each set, and the whole machine is constructed in such a substantial manner as to insure it against all liability to get out of order by ordinary fair usage.—*The Manufacturer and Builder.*



HARDICK'S VACUUM PUMP.

The Physical Causes of Fires.

BY J. HIRSCH, PH. D.

NOTWITHSTANDING the enormous explosive force of nitro-glycerine, which in some instances, as in the "King's service," Silesia, actually blew two workmen to atoms, so that no trace of them was discoverable, its use is steadily increasing, because it forms the cheapest blasting material, and gives the least labor, especially where water is encountered in mining operations. It may, therefore, not be out of place to mention all the precautions in the use and handling of this agent of destruction, which experience recommends. In the first instance I shall refer to Nobel's proposition of dissolving the nitro-glycerine in methylic alcohol, produced during the distillation of wood; and, on that account, also called wood spirit. Dissolved in a large quantity of these spirits, the glycerine is so diluted, its single particles brought apart at such great distances that they burn only slowly, and are incapable of igniting each other with the rapidity commensurate to an explosion. To render such oil again explosive, it is necessary to mix the methylic solution with water, when the nitro-glycerine separates as a heavy oily liquid ready for use. This last addition should be made immediately before using the glycerine, so that it has no time to decompose.

Ordinary workmen, and miners, unused to this dangerous agent should never be permitted to play and experiment with it. The tin cans in which it is transported should always be contained in a larger vessel, filled with water, which tends to cool the glonoine sufficiently to prevent its spontaneous decomposition. Even when not on the transport it should be kept in the same manner or in cool fire-proof vaults. Should the can happen to be frozen when needed, the can containing it ought to be placed into lukewarm water, to be thawed out; since in the frozen state the nitro-glycerine is much more destructive, and much less manageable than when liquid. A simple touch has, in that state, sent it on its mission of destruction in some instances. The point at which this freezing or solidification occurs is six degrees Centi-grade. If the blasting oil is used without a cartridge, the charge should be but lightly covered with sand and clay. In case such charge refuses to ignite, the cover of sand should be removed but partially and carefully, and filled with a small portion of the blasting oil, the ignition of which is usually sufficient for the explosion of the rest of the charge, remaining in the hole bored. The oil should, under no circumstances, no matter whether frozen or liquid, be treated roughly; should not be beaten with a hammer or cut with an axe, as is often done by careless workmen. Highly recommendable is the use of oil in cartridges, where it is less within the power of workmen to abuse it. In this condition the entire charge is also always certain to be exploded when desired; while it has occurred in the use of the oil, poured into the blasting holes loosely, that part of it drained into crevices of the adjacent rock, where, by subsequent removal of the loose stones, it exploded, when least expected. Its transportation in cans, placed in boxes of sawdust, should, by all means be prohibited; for, if accidentally the can should become leaky, the nitro-glycerine, saturating the porous sawdust, would soon heat up sufficiently for spontaneous decomposition, which would increase in extent, until it assumed the shape of an explosion.

The above precautions are indicated in the transportation of the ordinary nitro-glycerine. But Nobel's invention of "dynamite" ought to abolish the use of ordinary blasting oil altogether. Dynamite is no more nor less than nitro-glycerine, mixed with at least 25 per cent. of finely powdered earth, sand or glass. This admixture renders the blasting oil unexplosive, except by actual contact with a spark of flame; it being necessary, in both cases, to confine the oil in a closed space to produce an explosion. Its power is calculated to be eight times greater than that of gunpowder, and it can be produced proportionally cheaper than nitro-glycerine, to produce no desire for the use of the latter. The dynamite forms a powder which is used best in paper cartridges, containing a fuse. The blasting holes made for it, should, as nitro-glycerine, be made very narrow. It may briefly be mentioned that the dust of dynamite, like the dust and vapor of nitro-glycerine, is poisonous, causing headache and dizziness, although miners generally become accustomed to it. For the sake of preventing heating or great damage, in case of an accident, nitro-glycerine or dynamite should never be stored or transported in large packages; they should always be stored by themselves, not with other merchandise, and no one should have access to them but a person familiar with their great destructive power and general nature.—*Spectator.*

Range of the Human Eye.

THE range of the human eye may be judged of from a consideration which gives us at the same time a good idea of the scope of animal structure. Supposing that an individual of every known species were to take its stand between the two species that were respectively the next larger and the next smaller than itself, the smallest known animal at one extremity of the line, and the largest standing at the other; and then suppose we were to ask which creature occupied the middle space, having as many degrees of size below it as above, and as many above it as below, that place would be found to be occupied by the common house-fly. What a stupendous optical instrument must that be which, assisted with a few brass tubes and some discs of glass, shall discern a creature as much smaller than a fly as a fly is smaller than an elephant.

The Louisville Bridge.

THE great railway bridge on the Ohio River, at Louisville, Kentucky, will be ready for the passage of trains by the end of the present month. It is one of the finest and most important structures of the kind in the country. Its total cost when complete will be about one and one-half million of dollars. The length of the bridge is 5,200 feet, or nearly a mile. It is supported by twenty-five massive piers. The longest span is over the middle chute, and is 370 feet. At this point the bridge is 90¼ feet above low-water mark. There is a draw-bridge over the canal of 114½ feet clear span. The grade from the Kentucky side is 82 feet to the mile, the grade on the Indiana side being nearly 79 feet. A long and heavy embankment is necessary on the west side of the river, and that is nearly done. This bridge, in addition to its railroad uses, is built for street cars and wagons, the supposition being that at certain times of the day—only one-eighth of the twenty-four hours—the railroad trains will occupy the bridge, leaving it free the rest of the time for ordinary travel. The estimates of this grand structure tell the story of what it is. The masonry cost $476,962; the iron superstructure, $776,090, the whole amounting to $1,600,000.—*The* (Troy) *Polytechnic.*

The Preparation of Iron Plates for Tinning.

THE manufacture of tin-plate forms an important branch of the iron trade; and anything which has reference to the art of tinning must be of considerable interest to those firms which are engaged in the business in South Wales. Improvements in the production of these plates have been very frequently made, and considerable ingenuity and labor have been devoted, both at home and abroad, to the discovery of some means of cheapening and simplifying the present process. The energies which have been turned in this direction have not always met either with the success or the reward which so laborious an investigation required; and as tin plate is an article which is becoming more extensively used every day the question of cheapening and simplifying the cost of preparation is one of great moment to manufacturers. The present process of preparing the "block plates" is not only elaborately slow, but costly; and further, it is not altogether effectual in securing the plates against atmospheric or climatic influences. Mr. T. F. Parsons, of Maindee, near Newport, has, however, lately patented a process which will effect both a saving of cost in the manufacture of plates, and ensure them against atmospheric and climatic depreciation. In the present method, sulphuric acid only is used, in removing the impurities adhering to the plates, and this causes corrosion; but under Mr. Parsons' patent, the oxidation caused by the use of the sulphuric acid is entirely prevented, and the plates brought up to a highly polished surface, not only effecting a great saving in the quantity of tin, but producing power not to be obtained by any other process. By this treatment of the plate, the pernicious "black pickle" process will be entirely abolished, the durability of the plate considerably enhanced, amalgamation of the metals made more perfect, and a saving of iron effected. Blistered plates will be unknown, and it is expected that one annealing and one rolling (in place of two), will be all that will be required to bring the plate to a higher state of perfection than can ever be obtained by the present more elaborate and expensive process. The simplicity of the machinery is one of the greatest recommendations of Mr. Parsons' patent. The process is now in operation at the Emlyn Foundry, Newport, where it has given great satisfaction. The cost of the machinery does not exceed £50.—*Trade Circular.*

New River Piers—Important Improvement and Changes.

THE river piers, both on the East and North rivers, have long engaged attention on account of their neglected condition. Already, however, many improvements have been made. Pier No. 35, foot of Franklin street, which was at one time both shaky, dangerous and too narrow, is now being made

safer and wider. A number of workmen have been employed on it for some weeks past. Five feet on each side have been added to its width, and the pier at present is 600 feet long and 50 feet wide. Additional piles have been driven down to support it, so that in a few weeks it will be ready for the reception of the boats which make it their headquarters. The greatest addition made to the river front is the new pier which has been put up on the site of the old Red Fort, or North Battery, at the foot of Hubert street, North river. It is the largest and best constructed one in the city, and covers an area of over 8,000 square feet. The pier is in the shape of an L, the longest portion extending out into the river a distance of 600 feet from the line of West street; the other lengths are 320 and 180. Four sheds will cover the entire place, and will have a very fine and ornamental front facing West street. The pier and building are intended as the freight depot of the Empire Transportation Company, formerly of Pier No. 13. The width of the West street front will be 262 feet. There is a platform inside elevated 18 inches, and 186 feet long by 100 feet wide.—*Herald.*

Locomotives at the Paris Universal Exposition.

Mr. WILLIAM S. AUCHINCLOSS, Honorary Commissioner, has furnished a very interesting report of the steam engineering at the Paris Exposition, from which we take the following:

THE LOCOMOTIVE "AMERICA."

OUR own country was most creditably represented in the engine "America," furnished by the Grant Locomotive Works, of Paterson, New Jersey. The class of engine and workmanship produced by this company and its predecessor (the New Jersey Locomotive and Machine Company), are too favorably known to admit of extended remark. As presented in this engine they were a source of conscious pride to those who had crossed the Atlantic, as well as surprise to continental minds, the majority of whom are imbued with exceedingly plain ideas on the subject of ornamentation. Some go so far as to consider any attempt at the latter a grave misdemeanor, and paint their engines a solemn lead color or funereal black, without a single pencilling of gay colors to relieve the dull monotony. Of course, the contrast was very marked between such and the "America," with her bright German silver jacketing on boiler, cylinders, chimney, and head-light, her cab beautifully inlaid with ash, maple, black-walnut, mahogany, and cherry; with the tender, shaded, striped, and ornamented in a manner common to American practice. The cast-iron tender truck-wheels and hollow-spoked driving wheel centres gave rise to many speculations among those who have not yet learned their value. Much skill is evinced in the arrangement of the parts, and the reduction of their weight to a minimum consistent with strength. The link motion is well schemed and counter-weighted by volute springs, instead of the clumsy weights so general on foreign engines. A fitting acknowledgment of the high order of workmanship displayed was made in the award of a gold medal to the builders.

STEPHENSON & CO.'S LOCOMOTIVES.

The locomotives of Messrs. Robert Stephenson & Co., Newcastle-on-Tyne, and the Lilleshall Company, of Shropshire, are similar to each other in proportion and design. The boiler of the first engine is made with Alton's patent thick-edged plates, the longitudinal joints being lap-welded, and the transverse butt under a welded covering strip, to which they are double riveted. Both longitudinal and transverse sections of such boilers are exhibited by the Low Moor Iron Company, who own the exclusive right of manufacture. The plates are rolled with a uniform thickness of three-eighths of an inch, to within about eight inches of each transverse butting edge, where they gradually increase to a thickness of five-eighths of an inch, through which portion the holes are drilled or punched for the rivets. A section of the covering strip measures eight by five-eighths of an inch. The ordinary shifting link motion (without rocker) operates the valves. Its reversal can be accomplished either with the regular hand lever, or by a hand wheel operating a horizontal screw, into the groove of whose thread the latch of the lever catches. To accommodate itself to the arc described by the latch in the motion of the lever, the screw is swollen at its centre, being turned to the same radius of curvature as the arc. The hand-wheel performs its duty rapidly, and furnishes a very simple and efficient means for reversal. A general employment of the screw-reversing motion is observable on foreign locomotives, in fact almost sufficiently so for the practice to be regarded as universal. Another feature, and one that is common in Prussia and other continental countries, consists in the use of sliding double furnace doors. Horizontal slides are bolted to the furnace front, and receive the plate doors which are operated by two plain levers and a connecting link. The arrangement serves a good purpose in the event of a tube collapsing, as it more effectually protects the fireman. This engine is one of great excellence, and a model of good workmanship. That of the Lilleshall Company differs principally in the construction of the boiler, the arrangement of the link motion, which is of the Allan variety—giving virtually constant lead and equal opening of the ports in front and back stroke, for every notch of the reversing lever—and by the addition of a comfortable wrought-iron cab.

The engine of Messrs. Kitson & Co., of Leeds, is remarkable for the same excellence of workmanship displayed on the Stephenson locomotive.

THE TANK ENGINE "TITAN."

"Titan" is the name of an immense tank engine built by Messrs. Gouin & Co., for the Northern Railway of France. It was designed specially for heavy freight service, and completes an order for ten, the balance of which are now actively employed. Its novelty lies principally in the arrangement of the boiler; the main shell and fire-box are the same as used in ordinary practice, but instead of the products of combustion passing away through a vertical stack after leaving the tubes, they enter a front connection, return through two horizontal dome shells on the back of the boiler, and then into a horizontal escape pipe, which conducts them far enough away to prevent interference with the duties of the engineer. They pass through wrought-iron tubes in the first of these horizontal domes, which are surrounded by the live steam, thus insuring a perfectly dry supply for the cylinders, and in a measure superheating the steam. Feed water fills the second dome, and is heated by the main escape pipe through its centre.

The grate bars (cast in accordance with the system of Mr. Belpaire), are only three-eighths of an inch wide on the head and spaced five-sixteenths of an inch apart. Of these there are three sets running longitudinally, and terminated by a transverse one at the tube end of the fire-box. The vast volume of steam generated by this boiler supplies four cylinders, each pair of which connects with six coupled wheels. Although capable of drawing great loads, these engines are said to have an undue oscillation when moving at high velocities, and, as might be supposed, are peculiarly severe on the road-bed.

The Graeffenstaden engine is the only one exhibited having a steam tender. The arrangement of the parts the Commissioner clearly shows by an outline sketch, in which the dimensions are given in metres and decimal parts of the same. The internal diameter of the connecting inflexible steam pipe is 3 3-16th inches. A screw reversing gear throws the link into forward or back motion. Its workmanship is of the first order, and skill is evinced in the counterbalancing of the out and inside cranks with their connecting rods.

SMOKE-BURNING ENGINES.

The Paris and Orleans Company sent an engine built at their Ivry shop for express passenger service, and furnished with the smoke-consuming apparatus of Mr. Tenbrinck. Since its first appearance on the road in 1864, it has travelled 91,000 miles, or, on an average, 3,500 per month. The mean consumption of fuel during that time was twenty-one pounds per mile, and expenses for repairs amounted to $532, a little in excess of one-half cent per mile.

Twelve engines of the same type were subsequently constructed by the company, and have given equally as satisfactory results. The Krupp tyres on the carrying wheels of this engine were replaced after having travelled over 43,000 miles, but the drivers have neither required turning down nor renewal. A word about the smoke-consumers so much in favor on this railway. The object of the invention is to prevent the direct passage of the products of combustion from the fire to the tubes of the boiler, thus concentrating a more intense heat in the fire-box. It is accomplished by an inclined bridge wall extending across the fire-box, which springs from a point immediately below the tubes, and has an inclination of about 30° with a horizontal line. From the tube sheet the wall projects over a distance of about two-thirds the length of the fire-box. A similar inclination is given to the grate, which causes it to run nearly parallel with the wall. This wall is merely a copper box, having a 3½-inch water space; it is hung inside the furnace by suitable angle iron cleats, and maintains a circulation by four pipe connections with the water legs of the boiler, while a little cement closes the fissure between its edges and the sides of the furnace. Copper plate, five-eighths of an inch in thickness, is used for such bridge walls, and the circulating tubes are mads with internal diameters of three inches. The system was first applied to engine No. 91, of the Eastern Railway of France, in the month of November, 1859, where it continued to work with perfect satisfaction until the date of removal, viz., February, 1867, during which time the engine had travelled 162,000 miles. On examination, the copper box was found to be in nearly as perfect condition externally as when first adjusted. For the purposes of firing, three doors are considered necessary. That nearest the grate is made 33 inches wide by 6½ high, and immediately over this two circular ones, each 9½ inches in diameter. Steel is extensively used by this company in the construction of their engines, the boiler shell of the locomotive in question is made of plates five-sixteenths of an inch in thickness.

The Paris and Lyons Railway Company are represented by a well designed and neatly executed locomotive, to which the system of Mr. Thierry is applied for introducing fine jets of steam over the fire. This device will be mentioned at greater length in connection with the subject of steam boilers. It has already been applied to over 500 locomotives belonging to this company.

Mr. Walschaërt's system of operating the valves may be seen on several locomotives in the Belgian department. The parts are so arranged that the desired motion results from the combined action of a single eccentric and the cross head of the piston rod, through the medium of a rocking link and lever connections. From the amount of space required in the location of the details, it can more readily be adapted to outside than to inside cylinder engines. The motion developed is analogous to that of a stationary link, but cannot be ranked its superior, when sufficient care is bestowed in proportioning the latter; besides this, the effort expended in reversing the engine is no less arduous. The locomotive built by Messrs. Krauss & Co., of Munich, is the first one produced by their new establishment. A glance at the dimensions, weights, and power given in the table furnishes satisfactory evidence of its success. Mr. K. is convinced, after seventeen years' experience on Swiss and German railways, that the greatest strength with the least material can be gained by so incorporating the water tank with the main frame of the engine that it will form a deep box-girder of the structure, while the rigidity is secured by frequent staying. On this principle the tank plates are sufficiently strong, if made only one-fourth of an inch in thickness, but with a depth of three feet. The boiler is formed of steel, as well as the reciprocating parts of the machinery; its fire-box plates are corrugated, and the grate bars widely separated for the purpose of burning peat. The details of the connecting rods, injector, lubricators, etc., are well studied and possess several ingenious features.

The most perfect specimens of workmanship in the French department are supplied by the widely-known firm of Messrs. Schneider & Co., of Creuzot. They are three in number; the first has 16x24 inch cylinders, and was built from drawings prepared in England. The second, named the "St. Laurent," is a six-coupled tank engine, designed for service on the railways in the neighborhood of Creuzot, and the third engine for the collieries of the same place. The latter is exceedingly compact, simple, and represents a type which may to advantage be extensively copied.

AUSTRIAN LOCOMOTIVES.

In the Austrian department may be seen a ten-wheeled coupled locomotive, built by the State Railway Society for service on a short road in Hungary, on which there are ascents of one in fifty and curves of 360 feet radius. Six of the wheels are coupled together and connected with two cylinders eighteen and one-third inches diameter by twenty-four and seven-eighth inches stroke. The other four support a truck, between whose axles the fire-box of the boiler is situated; its front is pivoted to the frame of the six wheels. A crank-shaft over the forward wheels of the truck, with connecting rods to their crank-pins, and the pins of the drivers serves for transmitting motion from the drivers to the wheels of the latter. This engine, with its tender (loaded), weighs fifty-seven and one-half tons, is exceedingly complicated, and under no circumstances likely to be reproduced in the United States.

THE MAHOVOS.

A curious invention has recently been produced by Mr. C. Schouberszky, of 15 Wosnesenscaja, St. Petersburg. Its object is to dispense with steep gradients on railways by the addition of a carriage to each train which shall act the part of a storehouse for momentum developed during a descent, whence it may be reproduced at will and assist the locomotive on the opposite ascent. He has given the title of "Mahovos" to this new motor, and introduced a working model in the Russian department of the Exposition. The track for the same is 110 feet in length, having a rise of four feet in this distance. Near its lowest point is located a turn-table for reversing the "Mahovos," and a tank to receive the water contained in its train of five cars. The model weighs 275 pounds. The machine itself will readily be understood from the drawings accompanying the report, where an end view and section, a side view and a vertical view are given. The two ponderous fly-wheels are seen, in the end view, resting by means of the rollers, upon the central pair of wheels, which run upon the track between two larger truck wheels. The five cars filled with water weigh in the aggregate 1,390 pounds, and are coupled in front of the "Mahovos" at the top of the grade. When ready for starting, the two large fly-wheels are lowered until their axle rests on the four friction rollers, and these in turn on the six carrying wheels on the truck through the medium of four rolls on their shafts. Under the impulse of gravity, the train commences its slow descent, during which a high velocity is ultimately imparted to the fly-wheels. It reaches the turn-table after a lapse of two minutes. At this point the cars, being detached, continue their journey until the tank is reached, into which having discharged about 800 pounds of water, they are then led back to the turn-table. In the mean time the fly-wheels with their shaft are raised out of gear, the Mahovos turned end for end, and made ready to reascend after the coupling of the cars takes place. This being accomplished, the fly-wheels are lowered a second time, when the cars rise quickly to the starting point. The principle would have been more intelligibly illustrated by a track of double the length, having both a descending and an ascending grade. Although claimed by the inventor, that it is peculiarly adapted to conducting the loaded cars of a colliery down a steep hill and reascending with the empty ones, it is difficult to discover what advantage such an expensive substitute would have over the ordinary method of rope and pulleys. In the practical application of this method, Mr. Schouberszky designs making the fly-wheels of cast-steel, and so proportioning them that each will contain twelve tons of metal, and resist the centrifugal force due to a velocity of 800 revolutions per minute. He estimates the work developed by a velocity of 500 revolutions at 500 horse-power, and that such machines are available on grades of one in twenty-five. The benefits to be derived seem most apparent when considered as an assistant of railway motors in thinly-settled, hilly countries, where the traffic will not warrant heavy outlay in tunnels, grades, viaducts, etc. The principal restriction to its application, one would naturally suspect, will be found in the necessity of constructing entirely free of curves that portion of the line where its assistance is demanded.

FAIRLIE'S DOUBLE ENGINE.

But this method of overcoming grades tends to increase an element of evil already too prevalent on railways, viz.: the transportation of unremunerative weight. In connection with this subject the models submitted by Mr. R. F. FAIRLIE, of No. 56 Gracechurch street, London, in the English department, are worthy of the closest examination. This gentleman has, as it were, condensed the old idea of placing an engine and tender in front, and another in the rear of a train destined to ascend a steep grade. He, having first discarded the two tenders as useless in whatever light they may be considered, has joined the fire-boxes of the engines, thus forming *one*, and so arranged each of the frames with its wheels, cylinders, etc., that it is free to vibrate around a central pivot in conformity with any curvature given to the rails. By this arrangement the furnace must be fired from either side, along which also are the tanks, etc. The advantages are numerous. What was previously unremunerative weight immediately be-

comes effective ; not by overburdening a certain set of wheels, but by assigning a uniform amount to each. The engine may be run in either direction, and is consequently independent of turn-tables. At the same time, and on account of the position held by the two pivots, it is able to pass any curve that was possible with the single engine, and by the increase of its attractive force to surmount grades otherwise impassable. Mr. FAIRLIE, however, has advanced further than models, and already has engines built on his principle and running on the Neath and Brecon railway, a line which passes through the mountainous district of South Wales. They have worked with admirable success on grades of one in fifty. It should not be overlooked in estimating the value of this system that the parts of such engines are readily interchangable, not only admitting of greater facility in the repairs, but also diminishing the number of engines large roads are usually compelled to keep in stock. Mr. Fairlie's agents in the United States are John Cooke, Esq., of the firm of Danforth, Cook & Co., Paterson, New Jersey, and George E. Gray, Esq., consulting engineer to the Central Pacific railroad.

MEYER'S LOCOMOTIVE.

The system of Messrs. J. J. & Adolphe Meyer, of Mulhouse, France, is analogous to that just mentioned, but makes use of the ordinary locomotive boiler, and places one of the frame pivots under the centre of the fire grate, the other under that of the smoke box. These gentlemen furnish their engines with the Stradel coupling link, of which Messrs. J. F. Cail & Co., of Lille, are the agents. The parts of this link are so disposed that the strain exerted by the train acts as if applied at the centre of gravity of the locomotive, even during its passage around the sharpest curves.

Ere the publication of these remarks a new era will have been inaugurated in the history of railway engineering. The rails spanning Mount Cenis from St. Michel, in France, to Susa, in Italy, a distance of forty-nine miles, are now laid and the ballasting nearly accomplished; so that within a few months the toilsome ride of ten hours, by diligence, will be reduced to one of six, besides saving the frequent changes of baggage now inevitable. Mr. J. B. Fell, the patentee of the adopted system, exhibits drawings of his locomotives and a model passenger car. The former are being built by Messrs. Gouin & Co., of Paris, the latter is from the manufactory of Messrs. Chavelier, Cheilus, Jr., & Co., of No. 61 Quai de Grenelle. As this very ingenious system will then have appeared and been discussed in the light of actual experience, any further remark at this time seems unnecessary.

CAST-STEEL CYLINDERS.

Before passing from the subject of locomotives it should be mentioned that the Society of Mines and Steel Works of Bochum, Prussia, exhibit a remarkable cylinder formed of cast steel. It has been bored, and the valve seat faced off, and although many of the cores used in the moulding were quite intricate, in no portion can the slightest imperfection be discovered.

"BRIQUETTE FUEL."

The general use on the continent of "briquettes," as fuel for locomotives is a matter of deep interest to our railway companies, both as respects economy of consumption and room required for storage. They are composed of finely-powdered, washed coals, cemented with a material which forms the refuse of starch factories, or with coal tar. The mixture is subjected to the pressure of a piston in a cylindrical or polygonal case, and then exposed to a current of hot air in a kiln for about three hours. The resulting blocks weigh on an average eight pounds, and burn with a residue of from four to seven per cent. of ashes. The experience of the Austrian railways is, that they evaporate 7.2 pounds of water per pound of coal. Their introduction has been most rapid on the prominent roads of France and Belgium.

The Removal of Silicon from Pig Iron.

THE last paper read before the Iron and Steel Institute last week, and to which brief allusion was made in our issue of the 24th ult., was one of a new process for removing silicon from pig iron, by Mr. J. Palmer Budd, Ystalyfera. This was the process which was witnessed in operation by many of the members at the works of Messrs. Bolckow & Vaughan on Wednesday and Thursday. It is claimed for the process that it desiliconizes the iron as tapped from the blast furnaces without wasting the iron, and without any extra expense whatever beyond the usual cost of the pig; that in fact it was more economical to make than pig iron. The writer said: Substantiated as this is by practice on a large scale, my process must revolutionize the present practice in the iron trade. My usual mode of proceeding is to place a series of iron moulds, similar to those used, before a refinery, as near as convenient to the tap-hole of the blast furnace. I make a paste by moistening with water soft hæmatite ore, which, if gritty, is previously ground, and I throw a bucketful, containing about 60 lbs., into the mould, in a semi-liquid state, and spread it evenly on the bottom and sides. The mould being quite hot from the previous cast, dries the paste, which adheres to the bottom. I then put as much iron as is required from the blast furnace, and allow it to run over and fill the moulds to the depth of three-and-a-half to four inches. A great ebullition takes place, jets of flame, of a particularly white color, burn on the surface, which I assume to be the combustion of silicon in the oxygen liberated from the hæmatite. It is proved by repeated analysis that whilst the silicon was 1.00 per cent. in the white cast iron, it is reduced by this simple process to 0.200 or 0.300 per cent., or from one per cent. to 1-500th. A cinder is thrown up containing silica, some phosphorus and sulphur. The carbon is hardly at all removed. The appearance of the iron after the process is that of refined metal. The cost of the process is nil, as the iron contained in the hæmatite is reduced, and adheres as cast iron to the bottom of the iron in the mould. There is no sand or coke dust used, and the refined iron goes clean into the puddling furnace. The yield in puddling is that of refined iron, about twenty-one cwt. to the ton of puddled bars. The puddlers like to have one or two pigs of white with the metal so refined, as they say it works more liquory, showing that when the silicon remaining is only 0.200 or 0.300 per cent. the charge does not possess the necessary fluidity. The puddling furnace keeps longer in repair, no other fettling is used than hammer-slack, and the former allowance of shearings to make scrap balls has been discontinued. The men do more regular work, and, like the refined iron, the yields are larger. The puddled iron is of an improved quality, and much liked in the rail mills. My second process is the same in every respect as the first, only that I mix two-fifths by weight, and half by bulk, of nitrate of soda with the hæmatite ore, which is formed into a paste and applied in the same way. With this mixture the ebullition is greater, the flame is of a yellowish color, showing the ignition of some of the soda. The cinder is thrown up and out of the iron, over which it forms a crust, which can be separated when cold. The iron has a cellular and honeycombed fracture, like metal much overblown. The scoriæ contain sulphur, phosphorus, silica, and soda. The iron works drier and cleaner, and to a better yield than that made by process No. 1, but should have about one-third of grey pig added to make a very clean and tough iron. The only cost of the process is the nitrate, which in the proportion named comes to about 4s. a ton at its present high price. The author added:—In my opinion, the money value of my invention to the iron trade will be enormous; greater, perhaps, than that arising from the use of the blast furnace gases, said to be £1,000,000 a year, and which I first introduced into this country, and made known to the iron trade at the meeting of the British Association held at Swansea in 1849.—*Colliery Guardian.*

Mineral Statistics of Victoria for the Year 1868.

THE following statistics are extracted by the *Colliery Guardian* from the official return issued by J. F. SULLIVAN, Esq., Minister of Mines, Melbourne, to which mine owners and the officers of the mining department have freely contributed information respecting the condition and operations of the miners and mining companies throughout the colony:

GOLD.

The gold-fields were never more prosperous than they are at the present time. The mean number of miners employed in 1867 was 65,857, and in 1868, 63,181, showing a decrease of 2,676; but the number employed on the 31st December, 1868, is larger by 1,605 than the number employed on the 31st December, 1867. The decrease in the number of Chinese miners is only 376. On the 31st December, 1868, there were 15,244 Chinamen employed in alluvial mining, and fifty-six in quartz mining. The average earnings per man of the whole of the miners for the year 1868 was £104 18s. 8d., which, compared with the average earnings for 1867, £87 1s. 7d., shows a large increase. The estimated total value of the machinery and mining plant employed on the gold-fields on the 31st December, 1868, was £2,150,432, showing an increase of £71,237, as compared with the previous year. The number of distinct quartz reefs is 2,651, and the extent of auriferous land opened up by the miners is 884 square miles. The total area of land held as "claims" under the bye-laws of the mining boards on the 31st December, 1868, was 100,941a. 3r. 15p., of which 32,641a. 3r. 18p. were lying idle, being protected by registration or exemption certificates. The area held under gold mining leases on the same date was 15,337a. 2r. 28p., or less than half of the area lying waste under the mining board system. As showing the amount of labor expended on leased lands, the following table is instructive:

District.	Number of Leases.	Area. A. R. P.	Number of Men as per Covenant.	Number of Men actually employed as per Return.
Ballarat.....	33	1,916 1 38	1,187	1,746
Beechworth...	118	3,017 0 20	1,402	759
Sandhurst....	132	789 2 15	792	666
Maryborough.	185	1,455 1 0	1,672	774
Castlemaine...	106	1,123 2 12	1,043	837
Ararat.....	40	485 0 16	415	289
Gippsland	63	847 3 29	575	217
Totals.....	677	9,635 0 10	7,086	5,288

As regards leased lands, it is proper to state that the sums paid as rent do not represent the total amount of revenue obtained under the system. Forfeited deposits, fees for consents to assign and transfer, and moneys recovered from defaulters, are not included, and yet, in the aggregate, they reach a large sum. The estimated value of the claims in the several mining districts on the 31st of December, 1868, was £8,869,504. During the year 1868, there were 886,228 18-20 tons of quartz crushed, which yielded an average of 10dwts. 15·37grs. of gold per ton. The new gold fields discovered during the year are as follows:—Berlin, Fiddler's Creek, Gibbo River, Gipsy Diggings, Gympie, (near Steiglitz) Havelock, Marong, Murrindindi, Spring Creek (Mormbool), Sydney Flat, Whipstick, Godfrey's Creek. Numerous other localitiss of inferior importance have been opened up during the year.

METALS AND MINERALS OTHER THAN GOLD.

Silver.—Only 2,651 tons of ores were raised at St. Arnaud, and 5,761½ozs. of silver obtained; but a large quantity of the gold got there and at Wood's Point was mixed with silver, and it is not known how much was parted in Victoria. The customs returns show that 5,604ozs. 9dwts. of silver were exported.

Tin.—There were 220 tons 7cwts. of black sand, (mostly oxide of tin) and 12,216lbs. of tin, exported during the year.

Copper.—About 275 tons of ores have been raised, and 41 tons 18cwt of copper and regulus exported.

Antimony.—There were 841 tons 15cwt. sulphide of antimony raised, and 867 tons 18cwt. exported.

Coal and Lignites.—Only a few samples were raised.

Flags and Slates.—There were 13,000 square yards and 700 tons of flagging, and 35 tons of slate raised during the year. The quarries containing roofing slates were not worked.

COAL.

According to the returns received from the lessees, 1,933 tons were raised up to 31st December, 1864, but since then nothing but a few samples have been obtained.

On the 31st of December, 1867, there were three leases in force, for an aggregate area of 1,598a. 2r. 30p. During 1868 twelve leases have been granted, and two have been declared void. The area under lease on the 31st December, 1868, was 7,528a. 3r. 19p., and the number of leases in force thirteen

Five searching licenses were granted for an aggregate area of 2,650 acres. No operations except sinking and boring, have been reported.

No lignite was raised during the year, and the total of December, 1867 remains unaltered—235 tons. The manager o the Patent Lignite Fuel Company, Lal-lal, reports as follows: "We have sunk a shaft, and timbered it down to the drift overlying the lignite, but having encountered a heavy flow o water, we had to abandon the shaft for want of a proper clay for 'puddling up,' before getting through the drift. Since then the lease has been transferred to Messrs. Robertson & Wagner, and it is intended to very shortly resume active operations."

KEROSENE SHALE.

A searching license was granted during the year for one square mile of ground on the Kerosene Creek, Baw-baw Spurs. The license has expired, and has not been renewed. Result not reported.

The imports of coal, iron, etc., into Victoria during the year 1868, are given as follow:

Of coal.....135,225 tons,	value	£178,900
" coke and fuel..... 201 tons 1cwt.	"	711
" iron pig.....4,045 tons 7cwt.	"	16,934

There were exported during the year:

Of coal.....40 tons 8cwt.	value	£ 63
" coke and fuel.....29 tons 10cwt.	"	128
" iron pig.....164 tons	"	933

The Avondale Fund.

MR. HENDERSON GAYLORD, of Plymouth, Penn., writes as follows in relation to the Avondale Relief Fund, of which he is the treasurer:

"PLYMOUTH, Penn., October 18, 1869.

"DEAR SIR—Your favor of the 15th is received. In reply I remark that I have received, as treasurer of the Avondale Relief Fund, $34,985 01.

Have deposited in incorporated Banks, in this County, on call at five per cent.....	$15,000 00
Paid out to the Distributing Committee for the relief of the sufferers.....	7,747 80
Portion yet remaining in their hands unexpended, deposited in First National Bank of Plymouth.....	12,237 21
Total.....	$34,985 01

"The Board of Trustees directed me to invest all over $10,000 in my hands on deposit in the banks of this county at five per cent. on all, but at the meeting on the 25th instant I shall suggest that all over $5,000 in my hands be put in United States registered bonds, which, at the present price of bonds and gold, will give about seven per cent.; also to call in the $15,000 now at five per cent., and invest it with whatever I may have over the $5,000 above named. Mr. George H. Stuart informed me in his last that he had over $30,000, mostly on interest; that he would soon close his account, and if in the meantime I wanted money, to let him know. I expect he will pay over shortly. I am informed that your mayor has some $23,000 in hand; have heard nothing from him since the marshal called on me some weeks ago, although I noticed that the Board of Aldermen had recommended the paying over to the treasurer the amount in his hands. Rumor says the Delaware, Lackawanna and Western Railroad Company made a donation of $20,000, but I have no official notice of it. The papers say the Second National Bank of Scranton has money paid to them on subscriptions; and some others, I suppose, have contributions, but have not advised me of the fact. I think the Board, at its next meeting, will direct notice to be given to those having money on hand that they be requested to forward the same to the treasurer. I regret that I have not a copy at hand of the rules and regulations for disbursing the moneys; in short, I may state that for the present they will give each widow $200 per year, and each child under fourteen and sixteen years $100 per year, to be paid monthly until otherwise decided. As you may desire to know the expenses attending the management, I will state that the Trustees and Treasurer get nothing. The Assistant Treasurer is to have $600 per year, and the Secretary of the Board, $400. The Assistant Treasurer pays monthly to the widows and guardians of the children, and keeps the books, except the treasurer's books, and collects the small subscriptions of the Valley.

"Very respectfully yours,

"H. GAYLORD,

"Treasurer Avondale Relief Fund."

Since the date of Mr. Gaylord's letter, the fund in the hands of Mayor Hall, to which he refers and which amounted to $23,625 61, has been paid over, and also the sum of $1,022 25, collected in the Metropolitan Fire Department, and forwarded to Charles E. Gildersleeve, Secretary of the Board. This amount, added to that reported in the hands of Mr. George H. Stuart, of Philadelphia, makes the total amount available for the purposes of the subscription $89,632 87. The total reported subscriptions in the various parts of the country were about $150,000, but it will be seen that nearly half yet remains uncollected, nor is there a sanguine belief that any considerable part of this sum will ever find its way to the sufferers by the great disaster.—*Evening Post.*

MINING SUMMARY.

California.

PACIFIC COAST MINING REVIEW.

We are indebted to the San Francisco *Commercial Herald* for the following condensed summary of mining affairs on the Pacific coast, for the three months ending with September 30th. The high standing of our cotemporary as a competent recorder of whatever affects the commercial interests of the Pacific coast, and its independent and disinterested position as regards mining enterprises, render its reports especially valuable and trustworthy. Says the *Herald:*

"Mining during the past three months, in common with almost every other leading branch of business on this coast, has suffered some abatement of its usual activity through the extreme tension of the money market. Owing to this cause, prospecting labors have been much restricted, and many projected enterprises postponed, while operations in progress upon numerous undeveloped claims, and even on some of the less productive mines, have been curtailed or wholly suspended. In a word, this pursuit, owing to the above, coupled with other special causes, has, during the past few months, languished to a degree never before experienced on this coast, and which, if it continues through the balance of the year, must result in a considerably reduced annual product of bullion. Not alone to a scarcity of money is this diminished activity in mining and consequent falling off in the yield of the precious metals to be attributed, it being largely due to other transient and unusual causes, such as miners' strikes in various parts of the country, a short supply of water in the placers, and the disastrous fire in the Gold Hill mines, whereby work has been impeded, the investment of capital discouraged, and the power of production greatly lessened at many of our most prolific mining centres.

"It has further happened during this period that a number of important mining enterprises from which favorable results were anticipated have, through mistaken calculations and bad management, proved partial, and in some cases utter failures, thereby further increasing the distrust awakened by other causes, and adding to the existing reluctance to embarking money in this branch of industry. While it does not seem likely that these obstacles will prove of long continuance, or that the mistakes made will to any extent be repeated; still, they have already had the effect to seriously set back this interest and to impair public confidence in it to a degree not generally understood or appreciated.

"The fluctuations that have occurred during the quarter in mining stocks call for no notice in a review of this kind, inasmuch as these changes, being dependent upon the manipulations of dealers in this class of securities rather than upon the actual value of the properties they represent, can have no connection or bearing upon legitimate practical mining.

"OPERATIONS IN CALIFORNIA—PLACER DIGGINGS.

"While the business of mining for the precious metals has suffered some contraction on the coast generally, this has been manifested to a less extent in California than in any other of the Pacific States or Territories, the most marked falling off in the gold product here having occurred in certain sections of the placer mines, through an insufficient supply of water. Viewed in the aggregate, however, the miners in this class of diggings have done moderately well, the yield of the older placers where the water supply has not been unusually short, having been equal to that of other seasons, surface deposits of limited extent having, meantime, been discovered in several new localities. Thus, diggings reported to be paying fair wages have been found within the past month on several gulches near Lytle Creek, on Cocomungo Mountain, at a point thirty miles northwesterly from the town of San Bernardino. The country about is heavily timbered, but water is scarce, only a single company having enough as yet to wash with, though a fuller supply is looked for upon the advent of the rainy season. The gold is generally coarse, some chispas worth forty and fifty dollars each, having been found. Quite lately prospects have been met with indicating the existence of extensive placers on Stewart's Fork of Trinity River, toward which a good many miners from the adjacent country have since been drawn.

"GRAVEL DEPOSITS.

"Work on this class of diggings has of late been extending rapidly, having proved generally remunerative wherever water could be commanded for carrying it on. These gravel beds would seem to be the most widely diffused of all our auriferous deposits, ramifying nearly all parts of the great California gold field. They are worked by all the various methods in vogue, the hydraulic process of washing being adopted wherever practicably. Among the localities most noted for this class of operations are the following, viz.: Central Hill, Calaveras County, where many claims pay from $6 to $8, and even as high as $20 per day to the hand. On Selby Hill, Nevada County, the earnings are nearly as liberal, large bodies of good material having been laid open. Rich leads of gravel have also been uncovered at Boston Hill, Calaveras County; at Rich Bar, on the North Fork of the American, where average wages of $20 per day have been made. The laying down of a large iron pipe across the gap near Big Oak Flat, Tuolumne County, by conducting the water of the Golden Rock Ditch Company across that depression, has laid open an immense extent of gravel range in that and Mariposa County to mining operations. Several years ago, the flume carrying the water across this gap was blown down, since which time very little has been done in these gravel diggings, from insufficiency of water for washing. With a restoration of the former supply, operations have been resumed, many thrifty camps having already sprung up, bringing prosperity to a large section of country.

"HYDRAULIC WASHINGS.

"Operations by this mode, by far the most effectual of any for disposing of large bodies of auriferous earth, have been attended with the liberal returns that usually reward them where the conditions are favorable. In all parts of the mining regions it is now employed, being most extensively used in Nevada and adjacent counties; San Juan, Little York, French Corral, Cherokee, Smartsville, Timbuctoo, Gold Run, Dutch Flat, and Forest Hill being the most active localities in this line of operations. More recently preparations have been made for inaugurating hydraulic washings at the Cascades on Deer Creek; at the Blue Tent, and elsewhere in Nevada County. One hundred and nine ounces were taken from Clark's hydraulic claim at Railroad Flat, Calaveras County, during the first week in September. At Black Hawk, Sawpit, and other localities in Plumas County, the hydraulic claims paid from $10 to $12 per day to the hand throughout the season of water.

"The business of

"WING-DAMMING AND FLUMING THE RIVERS

has not been entered upon very extensively the past summer, nor can it be foreseen what success these operations will meet with thus early in the season. The Weaver Creek Company, Trinity County, are pushing ahead with energy, having put down a large number of sluice-boxes already. Russ, Johnson & Co., now operating for the fifth year on the North Fork of Feather River, employ a gang of seventy Chinamen, and are taking out a large amount of dust. This flume is nearly 700 feet long, 35 feet wide at the head and 23 at the foot, having ample capacity to carry any increase of water from sudden freshets. Several other companies at work on this stream, aiming to either lay its bed bare by turning the body of the water into flumes, or rescuing a portion of it by wing-dams, are pushing ahead with good prospects of success, should no rise occur until late in the season.

"BIG CHISPAS AND STRIKES

"have not failed to occasionally reward the miner during the period covered by our running commentaries; the occurrence of these happy incidents appearing to have been rather more frequent than usual. Besides the rich strike made near the Sierra Buttes, elsewhere mentioned, several others of less magnitude have come to light, it not always being the policy of the recipients of this good fortune to make the same known. Early in September, two miners working on a quartz lode near Ophir, Placer County, struck a pocket from which they took 47 ounces of gold in two days. About the same time, another party took from a claim near Allegheny, Sierra County, a chispa weighing 11 pounds, a company of Chinese having a little before picked up in a claim they were working in the same county a nine pound lump, worth over $1,800. Cases in which half and quarter pound nuggets have been found have been by no means infrequent.

"QUARTZ OR VEIN MINING.

"In this branch of mining steady progress is being made, new lodes continuing to be discovered in all parts of the gold-bearing belt, and developments being generally pushed ahead with judgment and diligence. In the exploration of the veins more skill and economy is being observed, while in the treatment of the ore new and more efficient processes are gradually being introduced.

"Beginning on the south, we find that San Diego, through recent discoveries, is likely to establish for herself a standing among the mining counties of the State, a number of gold and silver bearing lodes of much promise having been found there within the past few months. Samples of the silver ore taken from one of these lodes indicates, by assay, a value of nearly three hundred dollars per ton.

"In the Soledad District, Los Angeles County, a number of small mills and arastras are running on auriferous quartz, with fair results, the Eureka Company's mill, ten stamps having lately cleaned up $1,295 from a crushing of fifty tons of rock. This mill is propelled by water, owing to a scarcity of which but five stamps are at present operated. This company, finding their reduction facilities insufficient, will soon erect another ten-stamp mill at this place. Until recently the only lodes discovered here were gold-bearing, though of these there is quite a number. Within the past two months a heavy vein of argentiferous galena has been found in the district at a point where wood and water are said to be abundant. Valuable deposits of copper also exist near by in the Soledad Mountains, upon some of which a good deal of work has been done, demonstrating both the abundance and richness of the ores.

"In Kern County several quartz mines situate near White River, with others on Kern River and in the Clear Creek District, are being worked with profit, though generally there is less being done here than was the case several years ago, when a number of large mills were put up about Havilah and for a short time operated with success. The sulphureted condition of the ores, however, of which there was a plenty, and of fair grade, finally put a check upon operations, and for two or three years past but little has been done in that section of the county. With this obstacle overcome, prosperity will no doubt be restored to the Clear Creek mines.

"In Mariposa there is more activity, though by no means as much as prevailed in that county many years ago. The work of sinking shafts and taking out ore is being prosecuted on a good many claims, and several mills have lately been erected here. In some cases the mills are unable to run for want of water, a difficulty that will last until they are supplied by the winter rains. In the mines upon the Mariposa estate there are now 130 men employed, a portion of them being Chinamen. The Pine Tree mine is in a condition to furnish 50 tons of rich ore daily, and the Josephine nearly as much more, the daily yield of these two mines varying from $2,000 to $4,000. Giant Powder and the single hand-drill is in use here, the Ryerson method of amalgamating still being retained. Having made extensive repairs on their other mills, this company are, according to report, about to erect a sixty-stamp quartz mill at the old Benton mill site, on the Merced.

"In Tuolumne, Amador, and Calaveras counties the quartz mining interest during the past quarter has not only held its own, but made some advances. As matters of recent occurrence, though not otherwise entitled to special notice, the Confidence company, near Sonora, cleaned up 290 ounces of gold, worth over $7,000, from a crushing of 190 tons of ore, having the week before, from a run of 170 tons, extracted $4,000. They have a good mine and a large amount of ore brought to the surface, with a new twenty-six-stamp mill, one of the best in the county. In August the U. S. Grant mill, near American Flat, upon which and the accompanying hoisting works and mine over $40,000 have been expended, started operations on ore, much of which, it was expected, would yield at the rate of $400 to the ton. It is highly sulphereted, however, and mixed with base metals requiring to be roasted.

"In Calaveras County some very prolific quartz veins are now being opened. Twenty-one tons of ore, taken, in the month of September, from the claim of Lewis & Co., at Wet Gulch, yielded $4,484, an average of $213 52 per ton. The lode is of fair size and seems permanent; a considerable quantity of ore equally rich having since been taken out. The claim of Gass & Co., situate near the above, affords much ore, yielding $100 per ton. The Coffee Mill vein in this county is becoming noted for turning out large chispas, some of which range from twenty to thirty dollars in value. A large chimney has been struck in the Petticoat mine, at Railroad Flat, that returns $30 per ton by mill process. A 16-stamp battery is kept running on ore from the Palmo mine, to which twenty more are to be added when the shaft, now down 200 feet, shall be sunk double that depth.

"The claims about Volcano and Sutter Creek, Amador County, are, as a general thing, turning out satisfactorily. A lot of ore from the Marklee lode, near the former place, milled $50 per ton. Powerful steam hoisting works have been erected on the Lincoln claim, owned by ex-Governor Stanford and others, and lying a short distance north of the famous Hayward mine, the property of the Amador Company, which latter still continues the same enormous yield of gold that has characterized it for so many years past.

"In El Dorado and Placer counties some progress in vein mining continues to be made. Seventy tons of ore from a quartz vein near Newcastle, lately crushed, gave $2,500, being at the rate of $36 per ton, while a lot from the Evening Star yielded $40 per ton. The mill of the Eureka Company, near Georgetown, El Dorado County, has started up and is doing well. Several other mills in this county are making fair earnings and various movements recently set on foot indicate a revival of quartz mining in El Dorado, for a long time greatly neglected.

"In Nevada, the great quartz mining county of the State, this branch of business, though interrupted by the miners' strike early in the season, has suffered no general abatement, nearly all the leading mines being now in successful operation. At Grass Valley, besides the entire number of old mines, all of which are turning out their usual complement of bullion, the Idaho, a new claim, has been added to the list of productive mines here, turning out at the rate of $40,000 per month. The old Allison Ranch mine, at one time one of the most profitable in the State, but for several years closed, having been suffered to fill with water, has again been drained and re-opened and is now producing nearly as well as ever.

"In Sierra, Butte, and Plumas counties, this industry has been active and prosperous, some important new lodes having been struck, and the mills nearly all having been kept profitably engaged. The Bush Creek mill, in Sierra county, running ten stamps, has, during the past quarter, been crushing ore that yielded $31 31 per ton, its earnings having been at the rate of over $100,000 per year. The Alaska Company's five-stamp mill has lately completed a crushing of 1200 tons; result, a yield of $38 to the ton; cost of milling and mining, $12; net profit, $26; dividends for the past quarter, $30,000. In the month of August, a piece of gold was taken from a claim near the Sierra Buttes, weighing 106 pounds, the total amount extracted therefrom in one day having been $50,000. The Independence and the Reis or Sierra Buttes mines, near the same locality, continue the heavy yields that have so long distinguished them, the latter being one of the most largely productive and profitable mines in California. Derrick's mill at Oregon City, and the Trojan mill, near Enterprise, Butte county, have been running steadily, and with remunerative results to the owners.

"At Black Hawk, Plumas county, a series of ledges has been located under the Act of Congress for obtaining title to mining grounds, which promise to develop into a valuable mine, one hundred tons of ore recently extracted from it having yielded at the rate of $25 per ton. Four men have taken out, during the past seven months, $20,000 from this claim, and a mill is much needed for working its ores. From the Crescent mine heavy shipments of bullion have been made. Of the twenty-five quartz mills in this county, carrying an aggregate of three hundred stamps, nearly all are running, and the most of them doing well.

"In Trinity, Siskiyou, and Klamath counties, quartz mining and mining operations have been steadily on the increase, and that portion of the State will in a few years more be scarcely second to any other in the multitude of this interest. Mills are being rapidly multiplied throughout that region, which, besides a great extent of good mines, has the advantage of an abundance of fine timber, with water-power in many places for the propulsion of machinery.

"Crossing the Sierra to Inyo, Mono, and Alpine counties, we find that while there has been considerable activity in working the argentiferous galena of the former, very little has been done during the quarter we are considering in either of the others. As most of the ores in Inyo require to be reduced by smelting, many small furnaces have been erected there for that purpose, from which a good deal of imparted metal has been turned out during the summer; and there is no doubt but this district could be rendered largely productive of the precious metals, were it aided with the skill and capital requisite to that end. Recently a quartz mill has been built at Lone Pine, designed for working ores from Cerro Gordo, the principal district in that county.

"STATE OF NEVADA.—WASHOE MINES.

"The occurrence of a disastrous fire in the month of July, suspending operations in several of the leading claims at Gold Hill, besides resulting in great injury to the mines and a deplorable loss of human life, caused a material reduction in the amount of bullion that would otherwise have since been shipped from that point. The damage done to these mines having been repaired, they, in common with the other productive claims along the Comstock lode, have since been turning out their usual complement of ore, the most of the mills in that vicinity having been kept fully supplied and constantly running. The entire line of Comstock mines are yielding fully as well, and are thought to present a more encouraging appearance than they did earlier in the season. Work upon the Sutro Tunnel, long since projected, has within the past week been inaugurated, a number of miners having agreed to take the stock of the company in payment of a certain amount of labor.

"Besides the claims lying immediately on the Comstock range, a number of mines in the vicinity are being worked with remunerative results, some of these being located in Gold Cañon, several miles from Virginia, and at one time esteemed valuable.

"From the Humboldt region, where the ores, though generally rich, are apt to be rebellious, considerable shipments have been made to San Francisco since the completion of the Central Pacific Railroad; a business that is likely to increase rapidly hereafter, as the facilities for reduction are limited in that country.

"THE WHITE PINE DISTRICT.

"In this region, a more healthful condition of things having supervened upon the subsidence of the excitement and wild speculation that followed its early settlement, its real merits are beginning to be made manifest through the large and steadily increasing shipments of bullion being made from that quarter. That many losses have been incurred through injudicious investments in White Pine, and many exaggerated stories related of its richness, admits of no question. It is probable that in the settlement of no other district or locality, have so many blunders been committed in so short a time as here; yet it is equally true that no other has ever turned out such magnificent results for the first year of its history as this. During the twelve months ending Sept. 15th, there was shipped through the house of Wells, Fargo & Co., as appears by their published statement, the sum of $3,030,217 74, being the product of White Pine ores for that period; besides which, there were transmitted through other channels at least $130,000 more, making a total for the year of $3,160,217 74; being a larger amount than was produced from the Comstock lode for the three entire years following its discovery, and more, no doubt, than was ever extracted from the mines of any other district within so short a period after they were first found. With but nine mills, the most of them second-hand, and several of the number small and imperfect, the whole carrying scarcely more than one hundred stamps, this district is now producing bullion at the rate of about $80,000 per week. In the course of the present month, nearly double this number of stamps will be in operation, increasing in a proportionate degree the weekly product of bullion; and all this with a comparatively small expenditure for the erection of mills or

the development of the mines. Taking the year through, the average number of stamps running would not exceed fifty, giving an annual yield of more than $63,000 to every stanp—a result unparalleled in the history of mining. Should this product keep pace with the increase of stamps, the yield of these mines for 1870 would approximate $18,000,000. In addition to the bullion already extracted, it is estimated that the ore now raised, but unworked, would, if reduced, yield at least $2,500,000 more. With these few allusions to general estimates and results, we close our observations on White Pine, with the remark that it is the opinion of those most competent to judge, that these mines have capacity to keep five hundred stamps profitably employed for many years to come.

"OF THE OUTSIDE DISTRICTS IN EASTERN NEVADA.

"We have only room to say that many of them carry in their surface indications almost conclusive evidence of great mineral wealth, presenting the most inviting fields for the prospecting miner and the investment of capital. Among the number, embracing some twenty-five or thirty all told, the Mineral Hill, Pinto, Eureka, Tem-Piute, Reveille, Troy, Patterson, Robinson, Sacramento, and Egan, would appear, from the number of valuable lodes they contain, their ready accessibility, and the amount of work performed in them, to present the strongest claims to public attention. In several of these districts a large amount of work has been done, and a few mills are now running with success. In both the Robinson and Patterson districts a first-class mill has recently been erected, and is now operating with the most gratifying results; the former district surpassing all the others in the matter of good lands, grass, timber, and water, while it rivals White Pine itself in the apparent value of its mines. In addition to these natural aids, the district enjoys the further advantage of ample capital, controlled by experience and energy, for the development of its resources and the general advancement of its interests.

"Lying from sixty to eighty miles north of Elko, on the Humboldt River, is the Cope, and one or two other districts, from which very favorable reports have been sent out during the past few months; there being little doubt but the former possesses the elements to sustain a considerable population, if capital could be had to give them employment. There are now several hundred people in that section of country, a good wagon road having been built connecting it with Elko, and affording easy means of reaching it.

"Through the facilities afforded for transportation and travel by means of the Central Pacific Railroad, the rich mineral districts of interior and Eastern Nevada promise to become speedily settled and improved, this great highway having hastened this consummation by many years.

"OREGON.

"Of mining operations in this State during the last three months we have nothing very encouraging to report. The rumored discoveries of placer diggings on the head-waters of Lewis River, and also on Moose Creek, both of which caused some stir in mining circles a month or two ago, turn out to have had but little foundation. On Burnt River and Perry Creek fair wages have been made, and a large ditch is being dug to lead water into the former, which, when completed, promises to convert this into a prosperous camp, as a great scope of good ground will thus be rendered available for mining purposes. A number of quartz mills are running in different parts of the State, only a few of which have attained to more than a very moderate success.

"IDAHO.

"Mining in this Territory has not of late been signalled by any startling results or marked activity. The leading companies in the Owyhee country continue work upon their claims and are making out well, notwithstanding the disastrous break-down of the Rising Star Company, who, through the failure of their mine, sustained a loss the past year amounting to over $300,000. In other parts of the country quartz mining remains in a quiescent state, there being also some falling off in the product of the placers as compared with last year. In regard to the late discoveries on Loon Creek reports are conflicting, the weight of evidence being adverse to both their extent and richness.

"MONTANA.

"The condition of things appears to be much the same here as in Idaho, the placers being well nigh exhausted, with mining operations brought to a stand-still in many localities where diggings still exist, for want of water. New gulches of limited extent are occasionally discovered, towards which such a rush at once sets in that not one in a hundred is able to secure a claim. The business of vein mining is on the increase, a great many quartz mills having been put up and run with about the same average results as in this State. There being many advantages for prosecuting this business, it promises to become both permanent and profitable in Montana.

"UTAH.

"Both placer and vein deposits of the precious metals exist in this Territory, but the hostility of the Mormons having rendered it unsafe for the whites to prospect there, but little has been effected towards their development. Attracted by rumors of rich placers on Sevier River, parties of Gentiles strong enough for self-protection have lately started for that region, and it will not, probably, be long until something more definite is known as to the extent and value of its mineral resources.

"ARIZONA.

"Owing to the hostility of the Indians and other difficulties and causes of discouragement, the mining interest in this Territory remains in a backward condition, very little having been accomplished, either in the placers or vein mining. Owing to the dullness that prevailed earlier in the season in the White Pine region, many parties left that section, and, prospecting throughout south-eastern Nevada, finally entered Arizona, where they have been engaged for some months past exploring the northern and interior portions of that Territory. As yet we do not learn that these parties have made any discoveries of importance, notwithstanding they were made up of men of the right kind, and there were rumors of rich placers having been found off in that quarter; these, in fact, being the inducing cause of starting out most of these expeditions. More recently two strong and well equipped companies left Prescott for the interior and south-eastern part of the Territory, others having preceded them from that neighborhood. As yet neither of these parties have reported any discoveries of value, if, indeed, anything definite has been heard from them. Some of the companies who left Eastern Nevada for that country have returned, declaring a preference for the former as a field for prospecting, the evidence of mineral wealth being more abundant there, while in every other respect it is incomparably ahead of any part of Arizona."

BULLION AND COINAGE.

The treasure exports of the first nine months of the present year have been $30,488,766.56, or a little over $2,000,000 more than during the same period last year. The coinage at the Branch mint for the same time has been $9,586,500, or nearly half a million dollars less than in the first nine months of 1868, and nearly four millions less than during the same period of 1867. The circulation of coin through the express companies has been: to the interior, $15,238,934; and from the interior and coastwise, $10,188,790, showing a balance against San Francisco of nearly $5,000,000. The receipts of treasure have been (through Wells, Fargo, and the Pacific Union):

	1868.	1869.
From the Northern mines	$30,562,237	$29,655,700
From the Southern mines	3,456,720	4,684,136
Coastwise	3,338,426	3,156,840
Total	$37,357,383	$37,496,676
Of which were coined	5,114,155	10,188,790
Of which were uncoined	32,243,227	27,307,886

The receipts of treasure from British Columbia, etc., have been $4,434,683, against $2,138,861 for the same period last year.

Pennsylvania.

THE PETROLEUM TRADE.

From the Monthly Petroleum Report of the *Titusville Herald*, for the month ending Sept. 30, we make the following extracts:—

The production underwent a considerable increase during the period under review on account of an unusually great degree of success having attended the development during the latter part of August and nearly the whole of September. The average daily product during the month, as obtained from the difference in stocks and shipments, was 12,645 barrels of forty-three gallons, an enlargement of about 500 barrels over the daily average during August, and an enlargement, as compared with the daily average for September last year, of about 1,140 barrels. The increase was general throughout the region. The yield of only one district decreased in any important measure, while that of but a few others decreased slightly. The most noticeable enlargement was in the Pleasantville district. The yield of this district had steadily fallen off from January last up to the latter part of August, when gas pumps or "blowers" were applied to many of the wells in the northern part of the district, and since then the product has increased. The yield of some of the farms was doubled during September by the application of gas pumps, and the product of the whole district was enlarged one hundred and sixty barrels per day for the month. The total daily yield of this district during September, as shown by the shipments from it and the difference in stocks, was 1,280 barrels. The product of the farms along the Allegheny River, between Oil City and Tidioute and those on West Hickory Creek, increased about 175 barrels. On the Pittsburgh and Cherry Run Oil Company's Tract, Upper Cherry Run, the increase reached 100 barrels. The product on the Blood farm was increased a like amount; that of the Church Run district fifty barrels, and that of Cow Run fifty barrels. On Lower Cherry Run there was an increase of ninety barrels on the A. Buchanan farm. The yield of the J. Buchanan farm enlarged fifty barrels, and that of Curtin tract about twenty barrels. On the C. and A. Clark farms, Upper Cherry Run, the yield increased eighty barrels, and in the Bean farm district the increase was twenty-five barrels. There was also a slight increase on the Tallman and Atkinson farms, and one or two of the small tracts on the same run. On Charley and Shaffer Runs the increase reached about fifty barrels, and on the Allegheny River, south of Franklin, there was an increase of a like amount, which occurred mainly at Parker's Landing. The product of this district averaged 436 barrels daily during every day of the month. The wells at this point are not worked on Sundays. As previously stated in this article, there was a falling off of consequence in only one district—that of Cherrytree Run. In this district the product of the J. Pierson farm fell off about one hundred barrels; that of the Baney farm about eighty, and that of two or three other tracts and farms from ten to forty barrels each. On a few of the smaller producing tracts there was a slight enlargement. The total product of this district during September was 1,089 barrels, against 1,231 barrels during August. Besides this decrease there were five or six farms in different parts of the region on which the yield decreased from ten to twenty-five barrels. The following table shows the production during September, the average per day, the production previously reported in 1869, and the average per day since January 1st; the product from January 1st to October 1st last year, and the average per day for the same time:

	BBLS.
Total shipment of Crude for September of bbls., of 45 gals. each.	401,248
Add—to reduce to bbls. of 43 gals. each	17,833
Total shipment of bbls. of 43 gallons each	419,081
Stock on hand Sept. 1st	332,129
Stock on hand Oct. 1st	292,419
Deduct decrease Oct. 1st	39,710
Total production during September	379,371
Average per day for 30 days	12,645
Production previously reported	2,632,861
Total production since January 1st	3,012,232
Average per day for 273 days	11,033
Total production same time last year	2,747,371
Average per day same time last year (274 days)	10,026
Average per day during September last year	11,486

THE DEVELOPMENT AND THE TERRITORY.

The number of new wells completed during September was considerably in excess of that completed during any previous month this year. The whole number completed was about eighty, and drilling was commenced on about ninety-six, leaving the number in process of drilling on October 1st, 331—or sixteen more than the number on September 1st, but twenty-nine less than the number on October 1st last year. Of the eighty wells that were completed, fully sixty produced in paying quantities. On Cherrytree Run two wells were struck to the southward of the wells that were producing at the date of our last report, which were, at the close of September, producing thirty and forty barrels respectively. These wells have extended the producing territory greatly, and since they were struck, there has been something of a revival in development in the district. The known producing territory was also considerable extended on Church and Upper Cherry Runs, between Charley and Shaffer Runs, and on the west side of Oil Creek, near Rouseville. On the Allegheny River, at Parker's Landing, the territory was enlarged somewhat. The number of wells in process of drilling at this place on the 1st of October was between sixty and sixty-five. These wells are located principally along the river and on leases immediately back from it, but there are several on Bear Creek about a mile from its mouth. The extent of territory which is considered to be of the producing order, but which is not actually developed, is now larger than at any previous time this year. The demand for leases is good, and the territory which was discovered during the month is being rapidly leased.

THE STOCK.

Under unusually large shipments, the stock in the region decreased during September, and on the 1st inst. the total was 292,419 barrels of forty-three gallons—a falling off of about 40,000 barrels. The decrease occurred mainly on the lower creek, and at two points on the Allegheny River. The amount in iron tankage was decreased by 39,000 barrels. The stock at the wells increased about 5,000 barrels, and that on the hands of refiners and in wooden storage tanks fell off about 5,000 barrels. This latter stock includes 1,500 barrels on the Pierson farm, Cherrytree Run, 330 on the Story farm, 500 at Tidioute, 800 at Titusville, 1,250 at Miller, and 1,500 at Petroleum Centre.

THE SHIPMENTS.

During September the shipment was larger than during any other month in 1868 or 1869. The total shipment of crude equivalent, by all routes, reached over 401,000 barrels of forty-five gallons, or about 420,000 of forty-three gallons, an average of 14,000 barrels daily. The shipment by the Allegheny River was 41,500 barrels.

THE PRICE.

There were no material fluctuations in the price of oil on the creek during the month under review. Quotations varied from $5.40 to $5.60 on the lower creek, and from $5.20 to $5.40 on the upper creek. These figures, however, represent the extremes, and but few sales were made at them. Of the amount that changed hands on the creek probably not more than 10,000 barrels were sold at the prices named, and the balance was disposed of at quotations ranging from $5.45 to $5.55 on the lower creek, and $5.25 to $5.35 on the upper creek. At the close of the month the stock on the hands of well owners unsold was very light.

Virginia.

PENNSYLVANIA IRONMASTERS SETTLING IN VIRGINIA.

A VIRGINIA paper a few days ago noted the presence, in Alleghany county, in that State, of several large ironmasters from Pennsylvania, who are examining the iron beds of the county, with a view to making purchases and establishing works there for the manufacture of the metal. These gentlemen were Messrs. Farmstone, of Easton, Pardee, of Hazlewood, and Heister Clymer, of Reading. The Richmond *Whig* says: "We learn that these gentlemen have become the owners of the valuable and extensive properties known as the Lucy Selina, the Australia and the Dolly Ann Furnaces, containing in the aggregate 35,000 acres of land. For the first named property they pay, if we are correctly informed, the sum of $22,500, for the second $10,000, and for the third $35,000. These sums bear a very insignificant proportion to the amount required to be expended in erecting works of the magnitude designed for smelting the ore with mineral coal and manufacturing pig-iron, which will require hundreds of thousands of dollars. The purchasers are not only experts in iron and coal, but they are among the largest operators in Pennsylvania, and represent a capital more than adequate to the largest plans that may be formed in reference to their present enterprises. Their investments are not with an eye to speculation, but to improve and develop the properties they have purchased, and to bring out of them the enormous treasure they contain. They have under consideration, we understand, the immediate starting of one or all the above furnaces upon charcoal fuel, not, however, with the expectation of present profit, as charcoal iron can now hardly be made with profit, in competition with mineral-coal iron, but in order to get their mines and works in good working order while the Chesapeake & Ohio road is being completed to the coal banks of the Kanawha, so that when this is done the mines may be fitted to yield with regularity the immense quantities of ore required in mineral-coal iron operations on the scale they contemplate operating. It is understood they will at an early day begin to erect their mineral-coal works, which will require several years' labor, with the view of a large production instantly upon their connection with the Kanawha coal field being made. This step at this time is contingent upon the rates the Chesapeake & Ohio Railroad will freight the charcoal iron at, and other facilities."

Georgia.

HOWARD LIME QUARRIES.

"THESE works," says the Philadelphia *Railroad Register*, "are a mile and a half from Kingston, immediately upon the Western and Atlantic Railroad, and are the most complete of the kind in the South. Over 1,400 bushels of lime are sold from them per week—200 bushels per day. A force of over thirty-five men are regularly employed here. The quarry is inexhaustible. After being worked for twenty-five years, it is now just opened. Col. Howard informed us that after the quarry had been worked eight feet deeper, the hydraulic cement now being worked, will be superseded by the pure, white, bird's-eye lime. The works are not making cement there now, as the machinery was destroyed during the war. Transportation can be had for the lime, on the Western and Atlantic Railroad, for two cents a mile per ton. This brings it within reach of all the cotton planters, as it can be bought at the mill at thirty-six cents per bushel."

VULCAN IRON WORKS.

The same paper says: "These works (near Chattanooga) are owned by a Southern company, principally New Orleans men. S. B. Lowe is the Superintendent. The establishment contains six puddling furnaces, four heating furnaces, two trains of rolls, and a tremendous steam hammer. Their working capacity is twenty tons per day, and they work day and night. They use pig iron, from several furnaces, among which are the Grantville, Tenn., Rockwood, Tenn. (Wilder's establishment), and Noble's, near Rome, Ga. This is the best iron used, as it is very nearly neutral. One-third of this iron in a charge will neutralize the whole charge. They work up, also, all sorts of scraps of iron, both cast and wrought. They make all kinds of merchants' and bar iron, rail, rods, bridge bolts, car axles, etc. They build freight and box cars, doing all the wrought iron work in the mill. They employ from ninety to one hundred and twenty-five hands, and intend making considerable enlargements soon."

Oregon.

THE CANYON CITY MINES.

A CORRESPONDENT writing under date Sept. 8, says: "But little is doing, on account of the scarcity of water. Canyon creek is the only stream that has held out, and in it the water has been limited, more so than any previous season; yet the prospects for a good run this fall are quite flattering. There are some prospects of the construction of a bed-rock flume in Canyon creek, which, when completed, will give an outlet for many valuable claims, and furnish employment for hundreds of men. The quartz mill at Marysville is pounding away with good results. The mills on Elk will start next week, from whence we look for good returns."

MARKET REVIEW.

The Coal Trade.

NEW YORK, Oct. 22, 1869.

WHOLESALE.—Trade has been very active during the past week, and prices have advanced about fifty cents per ton, for what coals are to be had. As yet, in consequence of the strike in the Lehigh Region, we are receiving no coal from that section. Schuylkill coals are also very scarce, while the Pittston and the Scranton coals are all over-sold. The Delaware and Hudson Canal Company report themselves ready for orders in Lackawanna Coal, which they offer at the following rates: Lump and Steamer, $6 50; Broken, $7; Egg, $7 35; Store, $7 85; Chestnut, $6 85, at Rondout. We would specially recommend these coals and prices at the present time to the buying public. The coal is sent to market in first class order and the prices are very low. The Wilkesbarre Coal and Iron Company are offering their favorite coals at our quotations, which dealers will also do well to remember. Mr. Samuel Bounell, Jr., is offering Wyoming Coal expressly prepared for him, at from $6 50 to $7 75. The seventy-sixth Scranton Sale is advertised in our columns this week to take place on Wednesday next. Seventy thousand tons of assorted sizes are offered, and if the market is as active on that day as at the present writing, an advance of $1 per ton may be expected. Dealers are beginning to get worried about a supply for the winter, and as we have before stated would be the case, have come into the market all at once. Of course they cannot be supplied, and the great demand causes prices to go up. We assured dealers two months ago that coal was as low as it would be, and to send on their orders. Many did so. Those that did not take our advice will now have to wait till they can be supplied at higher figures than we quote to-day.

RETAIL.—Consumers are ordering coal freely and there is an active trade doing. The Pittston Company advanced their prices to $8 50; other coals are selling at $9@10.

FREIGHTS.—In consequence of an extra demand for vessels, freights have advanced from 25 to 50 cents. See quotations.

OFFICE OF THE WILKESBARRE COAL AND IRON CO., 80 BROADWAY, NEW YORK, Oct. 20th, 1869.

A dividend of five per cent., free from government tax, payable on and after November 15th, 1869, has this day been declared. The books of the company for the transfer of stock will be closed from November 1st to 15th.

By order of the Board of Directors.

S. M. WILLIAMS,
Treasurer, pro tem.

The following table exhibits the quantity of Coal passing over the following routes of transportation to tide-water, for the week ending October 18, 1869, compared with the same time last year:

COMPANIES.	1868. WEEK.	1868. TOTAL.	1869. WEEK.	1869. TOTAL.
Phila. & Reading R.R.	90,969	2,470,982	98,356	2,944,022
Schuylkill Canal	31,840	737,167	5,566	519,533
Lehigh Valley R. R.	48,567	1,297,855	30,812	1,703,052
Lehigh and Sus. R. R.	15,093	381,350	31,245	691,503
Lehigh Canal	33,586	760,140		584,630
Scranton North	16,559	475,355	17,639	362,663
" South	16,654	861,702	25,840	773,736
Penn. Coal Co., rail	20,216	733,545	18,888	773,678
" " canal	1,673	24,020	238	14,806
Del. and Hudson, rail			3,659	111,933
" " canal, north	43,875	1,264,309	4,746	89,229
" " south			6,694	84,251
Shamokin	10,228	395,860	13,024	342,552
Trevorton	1,137	22,453	2,515	84,816
Short Mountain	3,562	92,942	1,997	54,343
Lykens Valley Coal Co.	1,637	70,660	1,462	57,528
Huntingdon & Br'd Top	6,494	207,274	7,058	282,009
Wyoming South	12,848	261,341	16,109	247,163
" North	4,863	65,186	6,001	53,727
Williamstown, Co'ly	4,535	113,840		157,171
Total	364,888	10,908,151	291,924	10,618,305
1868	291,924	10,938,305		
Decrease	72,964	289,816		

Report of Coal Transported over Lehigh Valley Railroad

For the week ending October 16, 1869, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVI'S Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy	13,171 09	341,123 08	354,294 17
" Beaver Meadow	1,812 09	338,219 14	340,032 03
" Mauch Chunk	22 13	2,3 03	245 16
" Upper Lehigh		8,581 11	8,581 11
" Hazleton	4,721 10	685,516 07	690,237 17
" Wyoming	11,415 00	347,949 08	359,364 08
Total	31,143 01	1,721,613 11	1,752,756 12
To Lehigh & S. R. R., at P'n. Hav. for rail	128 01	4,406 16	4,534 17
Do. for canal		120,734 09	120,734 09
At Mauch Ch'k for canal		97,546 03	97,546 03
Total Anthracite	13,271 02	1,944,300 19	1,975,572 10
Susquehanna Region Bit. Coal (Fall Creek)		552 03	552 03
Total by rail and canal	31,271 02	1,944,853 02	1,976,124 04
Same time last year	64,041 12	2,116,248 19	2,180,290 11
Increase			
Decrease	32,770 10	171,395 17	204,165 07
Forwarded East from M'h Chunk by rail	30,812 04	1,672,219 12	1,703,032 10
Same time last year	48,567 08	1,849,307 17	1,897,875 00
Increase			
Decrease	17,755 04	177,087 15	194,832 19

RECAPITULATION.

Forwarded East from M'h Chunk by rail	30,812 04	1,672,219 17	1,703,032 01
Delivered at M'h Chunk	4 11	733 12	738 03
Delivered on line of road above Mauch Chunk	5 00	6,649 10	6,654 10
Delivered above M. Chunk for use of L. V. R. R.	178 09	36,370 06	36,548 15
To N. C. R. R., at Mount Carmel		2,516 09	2,516 09
To L. & S. R. R., at P'n Hav., for railroad	128 01	4,406 16	4,534 17
Do. for canal		120,734 09	120,734 09
Do. Packerton for rail	142 17	3,676 00	3,818 17
At M Chunk for canal		97,546 03	97,546 03
Total	31,271 02	1,944,853 02	1,976,124 04

Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, October 14, 1869.

	Tons. Cwt.
From Port Carbon	
" Pottsville	
" Schuylkill Haven	5,566 05
" Port Clinton	
Total for week	5,566 05
Previously this year	513,966 11
Total	519,532 16
To same time last year	737,167 04

Report of coal transported over the Philadelphia and Reading Railroad during the week ending Thursday, Oct. 14, 1869.

	Tons. Cwt.
From St. Clair	39,621 15
" Port Carbon	8,490 07
" Pottsville	4,260 11
" Schuylkill Haven	22,339 11
" Auburn	3,257 01
" Port Clinton	6,857 08
" E. P. R. R.	118 01
" Harrisburg and Dauphin	10,150 14
Total paying freight	105,355 08
Coal for Company's use	3,360 19
Total for week	108,716 07
Previously this year	3,230,262 03
Total	3,338,978 10
To same time last year	2,864,958 05

Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the week ending Oct. 16, 1869.

WHERE FROM WYOMING REGION.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mauch Chunk Region	9,205 00	139,253 02
" Hazleton "	202 04	119,166 14
" Upper Lehigh "		77,193 12
" Wyoming "	21,827 16	621,564 06
Grand Total	31,235 00	957,177 14
Corresponding week last year	32,257 10	752,893 17
Increase		204,283 17
Decrease	1,022 10	
Forwarded South from Mauch Chunk	30,465 05	613,688 06
Delivered on line of Lehigh & Sus'na R. R., above Mauch Chunk	752 15	27,009 16
Delivered to Lackawanna & Bloom. R. R., at Plymouth Bridge	66 10	16,252 09
Delivered to Lehigh Valley R. R. Co., at Sugar Notch		5,151 03
Delivered at Coal Port, for shipment by Canal		295,675 09
Total	31,234 10	957,177 04

Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Oct. 16, 1869, were as follows:

From Cumberland & Pennsylvania R.R.	Tons.
Consolidation Co	4,217 09
Borden Co.	1,597 04
Balt. & Hampshire Co.	1,128 09
Midlothian Co.	341 10
Cooke	105 14
Maryland	114 17
From Eckhart R. R.	
C. C. & I. Co.	3,139 13
Total	10,644 16

BY C. & O. CANAL.

For the week ending Oct. 16, 1869, the shipments by the Chesapeake & Ohio Canal were as follows:

	Tons.
American Co.	3,057 17
Borden Co.	2,258 12
Central Co.	3,278 11
Consolidation Co.	2,980 01
C. C. & I. Co.	1,216 15
George's Creek Co.	668 01
Hamp. & Baltimore Co.	212 16
Midlothian Co.	658 06
Maryland.	1,749 01
For private parties.	3,403 12
Total for week	19,683 12

THE Coal Trade by canal continues brisk, and there is no surplus coal at the wharves in Georgetown and Alexandria.

CHESAPEAKE AND OHIO CANAL.—At a meeting of the President and Directors of this Company, held at Frederick City, Maryland, on the 13th inst., the following was adopted:

Ordered, That from and after the 1st day of November, 1869, no trade or traffic will be allowed on the Chesapeake & Ohio Canal on the Sabbath day, and that the lock-keepers be required to close the locks at 12 o'clock on Saturday night and to reopen them at 12 o'clock on Sunday night.

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK, Oct. 22.		AT PHILADELPHIA, Oct. 21.	
SCHUYLKILL.	R. A.	W. A.	R. A.	W. A.
Lump	$— —	$7 00	— —	6 50 to 7 00
Steamer	— —	7 00	— —	6 50 to 7 00
Broken	— —	7 75	— —	6 50 to 7 00
Egg	— —	8 50	— —	6 50 to 7 50
Stove	8 50	9 00	— —	6 50 to 7 00
Chestnut	— —	7 00	— —	6 00
Pea	— —	— —	— —	— —
LEHIGH.				
Lump	— —	— —	— —	— —
Steamer	— —	— —	— —	— —
Broken	— —	— —	— —	— —
Egg	— —	— —	— —	— —
Stove	— —	— —	— —	— —
Chestnut	— —	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A.	9 00	— —	— —
New England	"	— —	— —	— —
Locust Dale	W. A.	8 50	— —	— —
Honey Brook, Le'h	W. A.	8 00 to 8 50	— —	— —
Spring Mount.	"	8 00 to 8 50	— —	— —
Sugar Creek	"	8 00 to 8 50	— —	— —
Sugar Loaf	"	8 00 to 8 50	— —	— —
Fulton	"	8 00 to 8 50	— —	— —
Stout	"	8 00 to 8 50	— —	— —
Old Comp'y's.	"	8 00 to 8 50	— —	— —
Cross Creek	"	8 00 to 8 50	— —	— —
Chauncey	"	"	— —	— —
Girtardville	"	"	— —	6 50 to 7 00
McMichael	"	"	— —	6 50 to 700
Duncan	"	"	7 00	7 50
Shamokin	"	"	7 50	7 00
Lykens Valley	"	"	— —	8 00
Broad Top	"	"	— —	5 25
Hill & Harris	"	"	— —	6 50
Henry Clay	"	"	— —	6 75
Powelton	"	R. A.	— —	7 00
Burnside	"	"	— —	7 00
Kittaning Coal Co.'s Phœnix Vein			f. o. b.	7 50
		Lemon	"	$6 50
Cumberland C. & I. Co.'s on board				5 25
Central C. & M. Co.'s		"		7 25
Consolidated Coal Co.'s		"		7 25

[*Dealers in these coals may be found in our advertising columns.]

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Cst.
Scranton at E. Port	6 00	6 25	6 75	7 00	7 50	6 00
Pittston at Newb'g	— —	— —	— —	— —	— —	— —
Lackawana at Rond't.	6 50	6 50	6 75	7 00	7 50	6 50
Wilk'b're at Hoboken	6 50	6 50	7 00	7 35	7 85	6 85

For freights to different points, see "Freights."

Prices for Coal at Mauch Chunk.

	F. L.	Bro.	Gra.	Eg.	Sto.	Cst.
Lehigh	$4 25	$4 50	$4 50	$4 50	$4 75	$3 75
Wilkesbarre	4 25	4 50	4 50	4 50	4 75	3 75

For freight to Elizabethport and to New York see "Freights."

Prices of Foreign Coals.

October, 1869.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" " Cannel	14 00@— —
" " House	17 50@18 00
" " Orrel	16 00@18 00
Per ton 2240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@18 00
" " Cannel, "	17 00@20 00
Per ton 2000 lbs., delivered.	

Prices of Gas Coals.

September, 1869.

PROVINCIAL.

Duty, $1 25.

	Coarse. Gold.	Slack. Gold.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75
Lingan	1 75	@- 75
Sydney	2 13½	@- 71½
Pictou	2 13½	@1 12½
Little Glace Bay	1 50	@1 00
Caledonia	1 50	@- 75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co.	— —	@- —
Despard Coal Co.	$8 50	@8 00
Penn.	— —	@- —
Newburg Orrel Gas	— —	@- —
West Fairmount Gas Coal	— —	@8 00

AT PHILADELPHIA.

Powelton	$7 80

Prices at Baltimore—OCT. 1869.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$7 50@8 00
Pittston and Plymouth	7 25@7 75
Shamokin Red or White Ash	6 50@7 00
Lykens Valley Red Ash	7 40@7 80
Trevorton, Red Ash	— —@— —
By retail, per ton of 2240 lbs. delivered	9 00@9 75
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	4 65@5 00
West Fairmount Gas f. o. b.	— —@6 50

Prices at George'n, D.C., & Alexandria, Va.

September, 1869.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

October, 1869.

Wilkesbarre and other White Ash for cargoes	$— —@7 25
Lykens Valley	— —@7 50
Shamokin Red or White Ash	— —@7 25
Trevorton and Zebra Valley	— —@7 00

Freights.—OCTOBER, 1869.

TO EASTERN PORTS.	From Philadel'a.	From E. Port and Port Johnson.	From Newburg.	From Rondout.
Stamford	$2 00	$1 00	$1 25	$1 25
Norwalk	2 00	1 00	1 25	— —
Bridgeport	2 00	1 00	1 25	1 25
New Haven	2 00	1 00	1 20	1 25
Hartford	2 75	1 50	— —	1 75
New London	2 00	1 15	1 35	1 45
Norwich	2 00	1 25	1 45	1 50
Mystic	2 00	— —	1 40	— —
Stonington	2 00	1 25	1 40	1 35
Sag Harbor	2 00	1 25	1 40	— —
Bristol	2 00	1 30	1 50	1 45
Newport	2 00	1 50	1 50	1 45
Fall River	2 00	1 30	1 50	1 50
Providence	2 00	1 30	1 55	1 50
Dighton	— —	— —	1 55	— —
Warren	— —	— —	1 55	— —
Pawtucket	2 00	— —	1 70	1 65
New Bedford	2 00	1 25	— —	1 50
East Cambridge	2 50	— —	1 80	2 10
Salem	2 50	1 80	1 65	2 00
Newburyport	2 50	2 00	1 75	2 20
Portsmouth	2 50	1 60	1 70	2 10
Rockport	— —	— —	1 70	— —
Saco	2 75	1 75	1 65	1 75
Portland	2 70	1 80	1 65	— —
Bangor	2 50	— —	1 75	1 80
Bath	2 50	— —	1 85	— —
Middletown	— —	1 25	— —	— —
Amesbury	2 50	— —	— —	— —
Boston	2 50	2 00	1 65	2 00
Cambridgeport	2 50	— —	1 85	2 05
Taunton	2 50	1 55	— —	— —
Derby	2 00	1 15	— —	65
New York	1 55	60	— —	— —
Hackensack	1 75	— —	— —	— —
Jersey City	1 65	60	70	65
TO RIVER PORTS.				
Troy	1 75	1 25	60	65
Albany	1 75	1 24	55	50
Coeyman's	1 60	— —	55	50
Stuyvesant	1 50	— —	50	45
Cockscackie	1 60	— —	45	40
Hudson	— —	90	40	50
Catskill	— —	— —	40	35
Poughkeepsie	1 60	75	30	25
Fishkill	1 60	— —	20	30
Cold Spring	1 60	70	30	50
Haverstraw	— —	50	45	55
Nyack	1 60	50	55	50
Sing Sing	1 60	— —	60	50
Yonkers	— —	40	60	55
New York	1 55	80	70	—
Saugerties	1 55	— —	35	30
Rhinebeck	1 60	— —	30	35
Rondout	1 60	60	30	25
Tarrrtown	1 60	80	60	—
West Point	1 60	75	30	50

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 50

From Port Carbon, 8 cents per ton more.

TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$1 15
C. R. R., N. J., Easton to Elizabethport	1 70
Shipping expenses at Elizabethport	25
Total	$3 10

TO PORT JOHNSON.

L. V. R. R.	$1 15
C. R. R., of N. J.	1 70
Shipping expenses	25
Total	$3 10

TO HOBOKEN.

L. V. R. R.	$1 15
Morris & Essex R. R.	1 80
Shipping expenses	25
Total	$3 20

TO SOUTH AMBOY.

L. V. R. R.	$1 15
B. & D. R. R.	1 10
Cam. & Am. R. R.	50
Shipping Expenses	25
Total	$3 00

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	$1 70
" Port Carbon	1 70
" Port Clinton	1 70

TO NEW YORK.

From Schuylkill Haven	$2 20

Via Lehigh Canal.

TO PHILADELPHIA.

Lehigh Canal	$1 14
Freight and towage	1 15
Total	$2 29

TO NEW YORK.

Lehigh Canal	$ 71
Morris "	85
Freight	1 70
Towing	10
Total	$3 36

TO JERSEY CITY.

Lehigh Canal	$ 71
Morris "	95
Freight	1 60
	3 25
For re-shipment	30
Total	$3 55

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 45
Towage	20
Total	$3 36

TO NEW BRUNSWICK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 20
Total	$2 91

For Re-shipment—30 extra for shipping, and 10 cents. drawback.

Foreign and Provincial Freights.

September, 1869.

Foreign.	
Newcastle and Ports on Tyne	£15@£18 keel
Liverpool	15s. 17s. ton.

TO NEW YORK.

Provincial.	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25

TO BOSTON.

Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

Towing Rates.

TO EASTERN PORTS.

	Per Ton.
To New Haven	$ 40
Bridgeport	40
Southport	40
Westport	40
Norwalk	40
Stamford	40
	Per Boat.
Greenwich	$70 00
Port Chester	80 00
Mamaroneck	70 00
Glen Cove	55 00
New Rochelle	55 00
East Chester	60 00
West Chester	30 00
White Stone	30 00
College Point	25 00
West Farms	25 00
Flushing	30 00
Harlem and Mott Haven	20 00
Port Morris	20 00
Ninety-first street and Astoria	16 00

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

Boats of 150—250 Tons.	Per Ton.
To Manhattanville	9 cents.
Spuyten Duyvil	9 "
Yonkers	10 "
Hastings	12 "
Piermont	15 "
Dobbs' Ferry	15 "
Nyack	16 "
Tarrytown	17 "
Sing Sing	18 "
Croton Landing	19 "
Haverstraw	19 "
Verplanck's	20 "
Peekskill	20 "
West Point	21 "
Cold Spring	21 "
Newburgh	22 "
Poughkeepsie	22 "
Rondout	23 "
Boats of 100 Tons.	Per Boat.
To Manhattanville, and Return	$12 0
Spuyten Duyvil, "	14 00
Yonkers, "	15 00
Sing Sing, "	23 00
Peekskill, "	25 00

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

Pig, Scotch No. 1, ₱ ton	36 50@38 00
Pig, American, No. 1	39 00@40 00
Pig, American, No. 2	37 —@38 —
Pig, American, Forge	36 —@— —
Bar, Refined, English and American	85 —@— —
Bar, Swedes, assorted sizes (gold)	82 50@87 50
	Store Prices.
Bar, Swedes, ord'y sizes, less 5 ₱ ct.	— —@140 —
Bar, Refined " "	95 —@100 —
Bar, Common " "	87 50@ 90 —
Scroll " "	120 —@180 —
Ovals and half-round " "	120 —@145 —
Band " "	120 —@— —
Horse Shoe " "	120 —@— —
Rods, ¾ to 3-16 inch " "	110 —@155 —
Hoop " "	125 —@150 —
Nail rod, less 5 ₱ ct.	— 8½@— 9½
Sheet, Russia, as to Nos. (gold)	— 11 @—12
Sheet, Single, D. and T. Common	— 5½@— 7
Sheet, Galvanized	List 15@25 ₱ cent. discount.
Rails, English (gold), ₱ ton	57 00 @— —
Rails, American, at Works in Pa	77 00 @— —

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents: over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 18 @— 22
English Spring (2d and 1st quality)	— 9 @— 11½
English Blister (2d and 1st quality)	— 11½@— 19
English Machinery	— 12½@— 15
English German (2d and 1st quality)	— 14 @— 16
American Blister "Black Diamond"	— 10½@— 16
American, Cast, Tool do.	— 19 @— —
American, Spring, do.	— 10 @— 13
American Machinery, do.	— — @— 13
American German, do.	— 10 @— 13

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 32
Copper Bolts	— @— 33
Copper Braziers, 16oz. and over	33 @— 35
Copper Nails	38 @— 40
Copper, Old Sheathing, &c., clean	20 @— 21
Copper, Chili Pig	— @— —
Copper, American Ingot	22¾@— 23
Yellow Metal, New Sheating	— @— 27
Yellow Metal Bolts	— @— 27
Yellow Metal Nails	— @— 27

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2¾ cents ₱ lb.

Galena, ₱ 100 lbs	$— — @— —
Spanish (gold)	$ 50 @6 62½
German, do.	6 50 @6 62½
English, do.	6 62½@6 87½
Bar (net)	— — @8 87½
Pipe and Sheet (net)	— — @8 87½

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

	Gold ₱ lb.
Banca	38 @— —
Straits	32½@— —
English	31½@—

PLATES.	Fair to Good Brands. Gold.	Currency.
I. C. Charcoal, ₱ box	$8 57½@8 62½	$11 50 @12 00
I. C. Coke	6 75 @7 37½	9 00 @10 50
Coke, Terne	— — @6 10	— — @ 8 50
Charcoal Terne	7 87½@8 25	11 00 @11 50

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

	Gold.
Plates, Foreign, ₱ 100 lbs.	$— — @6 37½
Plates, Domestic, ₱ lb.	— 9 @— 12

REMARKS.

IRON.—The market for Scotch Pig remains quiet, and prices for all descriptions are a shade easier; we notice sales of 300 tons Glegarnock at $37 50; and 100 do. Eglington, $36 50. American continues dull, and the transactions consummated are generally at a lower rate than those previously reported; we quote No. 1, $39@40; and No. 2, $37@38; the sales are 200 tons Glendon Gray Forge at $37; 200 do. No. 1 Allentown, $41; 350 do. No. 1 Thomas, 400 do. Gray Forge, and 400 do. Charcoal Pig, on terms not transpired. New Rails are steady at prices noted in our last; 300 tons old Double Headed sold at $47 75; and 125 do. old T. and Street, on private terms. We have nothing to add to the remarks in our last, except that the market continues dull at previously quoted rates. Russia Sheet is unusually dull; in Boston, the Shipping List reports 300 packs at 11½ cents gold.

STEEL.—There is no change to report in quotations, and business in moderate.

TIN.—Since your last we have to report sales of 4500 Pig Straits on spot at 32¼@32½c. gold. Stocks now are very much reduced and in few hands. Holders are firm at 33c. for lots. Banca, 38¼ gold; English, Italian and French, 31½@31¾c. gold.

COPPER.—We have to report large sales at 22½@22¾c. for Lake and Baltimore. Market now firm at latter figure.

SPELTER—Quite active at $6 25@6 30 gold, for prime Silesian and Stolberg.

LEAD—Without much business. The market is firm at 6½c. gold for good foreign brands. Stocks are small and concentrated.

ANTIMONY—12½c. gold.

ZINC.—American Oxide, 8@8½c.; French do., 11¼@11½c.; metallic, 12@12½c.

MANGANESE.—Pembroke Oxide of Manganese, Lump, 4½c. per lb.; Powered, 5c.

Mining Stocks.

NEW YORK, Oct. 22, 1869.

THE following sales transpired at the first mining board this morning:

Buchanan Farm, 500@45; Consolidated Gregory, 200@1 70, 100@1 75, 1000@1 80, 200 B.3@1 75, 200 B.3@1 80; Quartz Hill, 300@1 35; Smith & Parmelee, 200 B.3@2 05; United States Petroleum, 100 cash 70.

The following are the latest quotations for Petroleum Stocks:

	Bid.	Asked.
Bennehoff Petroleum	28	35
Brevoort	1 50	1 75
Buchanan Farm	43	45
Home Petroleum	4 50	5 00
Central	56	65
New York and Alleghany	75	—
National	75	2 00
United States	68	75
Northern Light	60	75
United Petroleum Farms	12	15
Kynd Farm	28	32
Pithole Creek	1 50	—
Clinton Oil	2 00	—
Sherman and Barnsdale	—	—
Bergen Coal and Oil	15	25
Rathbone Oil	23	—
Union	15 00	16 00

San Francisco Stock Market.

SAN FRANCISCO, October 20, 1869.

	1st Board.	2d Board.
Savage	42⅝	44¼
Crown Point	11¾	12
Yellow Jacket	35⅞	36¾
Kentucky	1 35	1 36
Choilar Potosi	16¼	16½
Gould & Curry	67	68
Ophir	18½	18
Alpha	12⅝	13½
Belcher	11½	—
Imperial	34½	35
Hale & Norcross	1 26	1 40

ASSESSMENT.—Crown Point Company; $7 50 coin, per share. Delinquent Nov. 20th; sale Jan. 10, 1870.

London Weekly Metal Report.

LONDON, E. C., Oct. 8, 1869.

THE position of the Metal Market is without material change. The low prices at which some metals are ruling may, however, at any moment cause a more extended trade.

IRON.—At the preliminary meeting of the Staffordshire Ironmasters it was resolved to maintain last quarter's prices. The Welsh iron trade continues moderately active. Rails are still in great demand. Scotch pig iron has been steady at about 52s. 9. cash.

COPPER.—The market continues very dull for all descriptions. Chili bars have receded to £67 to £67. 10s.; to arrive, £68. 10s. to £69. India sheets are obtained at £78—perhaps a trifle less. English tough very dull. Australian continues to droop.

TIN.—The 61,500 slabs Banca tin offered by the Dutch Trading Company in public sale on the 1st inst., found ready buyers at 74fl., equal to £127. 10s. laid down here, since which the market has advanced to 76½fl., equal to £131. 10s. in London. A large business has been done here from £127. 10s. to £130. Straits is held for £130, but little has changed hands. English tin maintains its price: refined, £134; common bar, £127; ingot and block, £126.

TIN PLATES.—The demand has in no way improved, and prices are still unsatisfactory to manufacturers.

LEAD in moderate demand at previous quotations.

SPELTER.—Silesian in London about £20, and specials in outports have been sold at this price, but the nearest value is £20. 10s. English, Belgian, and Rhenish, from £19. 15s. to £20.

VON DADELSZEN & NORTH.

Application of Liquid Fuel to Metallurgy.

THE advantages of liquid fuel, when properly used, over coal for steam purposes have long since been fully demonstrated, and they stand unquestioned. Hitherto, the endeavors to utilize mineral oils have been chiefly confined to the furnaces of boilers; but now we have another eminently successful application of the oil furnace to metallurgical purposes. Our readers can hardly have forgotten the successful trips of the *Retriever*, a steam ship of 500 tons burthen, which was fitted up on the system of oil furnace invented by Mr. Dorsett, of London, England. This system consists in burning in the furnace the vapor of creosote, which is produced in an auxiliary boiler. The creosote is, in effect, distilled over, and the products of distillation are burned from jets beneath the steam boiler. Having established the success of the principle in one direction, Mr. Dorsett conceived the idea of utilizing it in another—that of heating iron plates for bending. The idea was first put into execution about four months since, when Mr. Dorsett obtained permission to apply his system of burning liquid fuel to a plate-burning furnace in Woolwich dock-yard. This was for plates of the ordinary thicknesses used in iron shipbuilding, and the results were so satisfactory that the authorities directed the principle to be applied to an ordinary plate-bending furnace and to an armor-plate furnace in Chatham dock-yard. It is to the latter of these we wish to direct special attention, as being a great triumph of the Dorsett principle of burning liquid fuel. On a recent occasion, we were present at some trials with this furnace, which conclusively establish the superiority of the liquid fuel over the coal furnace.

Under ordinary circumstances, the armor-plate bending furnace is lighted from four to five hours before the plate is bended in it. The time occupied in heating the plate for bending depends upon its thickness—one hour per inch of thickness being allowed. Taking then, a 6-inch plate—as upon the present occasion—we get from ten to eleven hours from the time of starting before the plate is ready for bending. Let us now see what the liquid fuel will do. Upon our visit to Chatham, the cold furnace was lighted, and after an hour was deemed sufficiently heated. A 6-inch armor-plate, 7 feet 6 inches long by 3 feet wide, was then consigned to the furnace, and after an hour and a half was drawn out thoroughly heated and ready for bending. Thus, in two hours and a half, we have the work of ten or eleven hours completely and satisfactorily performed. Nor is this all; the advantages of the system do not stop here. The plate was remarkably free from scale, which can only be accounted for by the absence of the deteriorating influence of the products of combustion in the ordinary furnace. Another valuable result arises from this same cause; thinner plates, when heated by liquid fuel and bent double, show no signs of cracking, as they usually do when they have been heated in the coal furnace. This important feature is reckoned to save ten shillings per ton on the metal, which amount it would lose in value by deterioration under the ordinary method of treatment. The vaporised creosote is supplied to the furnace under notice from the generator by six jets, which are led in through small openings, by which means also just a sufficient quantity of atmospheric air is admitted to support combustion. This method of supplying the heat also offers another advantage—it can be applied to the whole or any portion of the plate. Thus, if a plate requires to be bent at one end only, then the heat is directed to that part. Further, the rate at which the metal is heated can be regulated so nicely by either increasing or diminishing the number of jets. The consumption of oil at Chatham is 108 gallons per furnace per day.

Close beside the armor-plate furnace is another one for heating thinner plates, and which has been regularly at work for some time past. It is heated by four jets, and is supplied from the same generator as the large one, and which is placed between the two. On the occasion of our visit some half-inch plates were being heated and bent to various templates. The average time occupied in heating was seven minutes; with the ordinary furnace it takes from twelve to fifteen minutes for each plate. As already stated, the heating of the 6-inch plate was only experimental and preparatory to a regular course of practical work which is about to commence. But it was an eminently successful experiment, and, moreover, was not the first made in the same furnace. The plate in question had been through the same process three times previously, although its clean, smooth surface would not have led to that supposition, for it had the appearance of having had nothing done to it since it left the rolls. The future work of the furnace will consist in heating the armor-plates for bending for the "Sultan," a fine vessel of 5,226 tons burthen, now constructing close by the shop in which the Dorsett furnace is placed. In this furnace we have another practical evidence of the value liquid fuel when utilized in the form of vapor. In its working we have some of the most remarkable and unlooked-for results, which, while they fully satisfy us for the present, only lead us to expect further and even more important improvements in the application of the system. We cannot affect to ignore the labors of others in utilizing liquid fuel; but while giving them every credit for their ingenuity and perseverence, we are bound to regard Mr. Dorsett as the sucessful exponent of the principle. It was he who first demonstrated the practicability of running a vessel of 500 tons burthen by means of liquid fuel, and it was he who has now succeeded in advancing the science of metallurgy in an important degree, in a way which will prove highly beneficial to the iron industries of the world.—*Mechanics' Magazine.*

Streets of San Francisco.

FROM the annual report of the Street Superintendent of San Francisco, it appears that city has 102 miles of paved streets and 255,829 feet of sewerage. The cost of street work from July 1, 1868, to July 1, 1869, has been in round numbers $1,520,000; and the average cost has been nearly a million a year for ten years past.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00	10	15
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00		
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Church Union Gold	California					
Consolidated Gregory	Colorado				1 75	1 80
Combination Silver	Nevada			100 00		
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5 000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff,MonoCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson. 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					27	30
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		6
La Crosse Gold	Nevada Dist., Col	P. P. Fullerton. 71 B'way	1,000,000		10	1
Lander Hill T. & S	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold						
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		8⅛	8⅝
Mariposa preferred	California	do. do.			16½	17
Montana Gold		G. De Cordova	400,000		4	6
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe. 10 Wall	2,000,000			
N. Y. & Montana M. & D.	Montana	F. A. Chapman. 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M		W. H. Mailler, 108 Wall				
Ophir Gold	Comstock Lode, Nev	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith. 43 Ex. Place	1,500,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		1 30	1 35
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000			
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00		
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,600,000			
Silver Bend		F. W. Macy. 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen. 71 B'way	1,000,000			
Silver Peak & R. M	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	2 05	2 05
Social & Steptoe Con		T. H. O'Connor. 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					35	50
Twin River Silver	Nevada	J. F. R. Hadden. 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts. 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co		J. T. Rollins, 41 Pine	2,500,000			
Block-House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co		E. Kiscan, 90 B'way	5,000,000		28⅝	28⅞
Derby Coal Co		W. S. Davison, 11 Broad				
Dover Coal and Iron Co		L. Chase, 88 Wall				
Del. & Hudson Canal Co			10,000,000	100 00		
Ebervale Coal		G.L Stout, Treas.,111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin. 112 B'way	100,000			
Lackawanna I. & C	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co.		J. H. Roleton, 80 B'way	1,500,000			
Lehigh & Susquehanna						
Mahanoy			400,000	100 00		
McNeal C. & I. Co		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co		G. Wrighton, 34 Wall				
Peekskill Iron Co		W. Murdock, 7 Nassau				
Pennsylvania Coal Co		C. H. Mead. 111 B'way	3,200,000	50 00		
Richmond Iron Co		C. H. Smith. 165 B'way	1,000,000			
Scotia Coal Co		I. N. Soper. 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		G. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter. 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper						
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copoer	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st,	1,000 000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Ely, 191 B'way	500,000			
Wallkill Lead, ass'td		S. M. Pond, 70 B'way			10	

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co		H. Bogardus, 14 Pine				
Clough Stone Co		C. P. Williams, 50 Beekman	500,000			
Covill B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co	New Jersey	A. H. Farlin, 61 Malden L'e	1,500,000			

The New Era in the Metallurgy of Iron and Steel.

THE most careless reader can hardly have failed to observe the great rapidity with which new and important improvements in the manufacture of iron and steel have followed each other during the past few years. It is impossible to obtain, from the recognized standard works on the subject, a clear and correct notion of the present condition of this art. The practical iron masters have not only got the start of the professors and writers, in construction and operation, but the very processes which are revolutionizing industry are not mentioned in books of comparatively recent date. The latest improvements of BESSEMER, SIEMENS, HEATON, ELLERSHAUSEN and LURMANN are described here and there in pamphlets, reports and scientific or professional periodicals; and even the expert who has by diligent reading kept pace with their progress, is frequently puzzled to know where to turn for details of description or experimental results which his memory has failed to retain. A new book on the subject is called for; and yet a new book must be at present in many respects premature, since the multiplicity and novelty of recent methods forbid for some time to come an accurate and complete estimate of their value and scientific uses. Under the circumstances, the large octavo of Professor OSBORN is perhaps the best that can be expected. It is a vast improvement upon that of OVERMAN, which was never satisfactory and has long been out of date, if not out of print. Professor OSBORN relates in his preface, that the present work grew out of an attempt to re-edit Mr. OVERMAN'S treatise. The book contains all that was valuable in that treatise, (the material so appropriated being either enclosed in brackets or credited to Mr. OVERMAN by name) together with a vast and varied amount of modern information which has never before been collected in a single volume. The author deserves credit for the industry with which he has ransacked contemporaneous literature, as well as standard works of foreign authors, and gathered whatever might be of importance to American iron masters. Of course foreign students will find this material in more complete form in the publications of their respective countries, though even to them a compendious collection like this may prove convenient. But iron masters abroad will certainly pardon the repetition of what they know already, in view of the abundant information to be obtained from Professor OSBORN'S book concerning the results of successful practice in America. This country has reached a point in the metallurgy of iron, as in that of gold and silver, where other nations can learn of her as well as teach her, and we therefore rejoice at the appearance of every work on the subject which is thoroughly American, and not merely a hash of English and Continental practice. Professor OSBORN'S position as an instructor of young men, at Lafayette College, in Easton, Pa., in the immediate neighborhood of great iron works of every kind, has given him peculiar facilities for watching the development of this art in America, and we are glad to note that he does not lower the standard of his own country in deference to the brilliant banners of European science.

The enumeration of the contents of the work (which is a royal octavo of 972 pages, published by HENRY CAREY BAIRD, of Philadelphia,) is sufficient to show its comprehensive character. The first part is devoted to the theoretic metallurgy of iron, its ores and compounds, and their special properties, the theory of fluxes, fuel, etc. The second part, treating of the practical metallurgy of iron, describes and discusses the roasting of iron ore, the reduction of iron, the production of cast iron, the theory and practice of the blast furnace, mixing of charges, cinder, hot-blast, fire-brick, furnace gases, blowers, receivers, valves, hoists, etc. The third part is devoted to the manufacture of malleable iron, puddling, forging, rolling, shearing, piling, etc. The fourth part contains a treatise on steel and the processes of its manufacture. A full analytical index completes the work. The illustrations and plates are numerous, and generally well executed.

The value of this book to every ironmaster is beyond dispute; and recognizing the great labor involved in its compilation, we are reluctant to apply to it any severe rules of criticism. Yet we have been somewhat disappointed to find among its many excellences faults of a character which we did not expect. Professor OSBORN, in attempting to explain his subject to the comprehension of unscientific students, falls into errors which might have been avoided. It is not at all necessary, for instance, to use perpetually the term "rust," as synonymous with and explanatory of "oxide"—to speak of the "rust" of carbon and the two "rusts" of iron. Iron-rust itself is a hydrate, and frequently a basic carbonate; and there is nothing gained in simplicity by using terms which are *simply* incorrect.

Again, on page 497, we read that "silex, if in chemical union with any substance, such as oxide of iron, can be dissolved by hydrochloric acid under any condition; while silex in an uncombined state is not acted upon by it." This statement is, in the first place, not true, since not all silicates are soluble in muriatic acid; and, in the second place, not very clearly applicable to the case in hand, if it were true. In fact, we think this and the succeeding page a model of condensed, confused, and incomprehensible "simplicity." The author, in attempting to avoid technical terms, has avoided definite and intelligible statements as well; and the result is as "elementary" as chaos.

The fact is, that scientific nomenclature cannot be omitted from scientific books, except at the expense of accuracy; and while we recognize the benevolent intentions of Professor OSBORN towards his ignorant reader, we believe that he might have spared much muddy paraphrase, and conveyed equal knowledge, by adopting more rigidly the exact style appropriate to his subject. It is proper to add that he avows and defends his course in this respect; and therefore he cannot complain if we frankly declare our conviction that it has not added to the practical value of his book as much as it has detracted from its precision and real usefulness in the eyes of the intelligent metallurgist. After all, grumble as we may at this or that in the volume, now that it is published, we cannot do without it; and, as other professional men will doubtless sympathize with us in this respect, the publisher will have wherewithal to console the author. R. W. R.

New York Chapter of the American Institute of Architects.

ON the evening of last Tuesday (Oct. 19th) we had the pleasure of attending the Annual Reception and Exhibition of this Association, at their new rooms, 925 Broadway. Among the members present we observed Upjohn, Gilman, Hunt, Sturgiss, Hatfield, Bloss, Wight, and others, while the circle of guests, though not very large, included Rev. Dr. Frothingham, Mr. Willis (brother of N. P.), Geo. P. Putnam, the genial and well-known publisher, etc., etc.

The early part of the evening having been spent in a careful examination of the very beautiful and excellent designs with which the walls were almost covered, those present did ample justice to a recherché collation, after which an elaborate report was read by the chairman of the library committee. A few extracts from this document will give the best idea of its scope and character. Referring to the progress thus far made, the committee say:

"Though our library is an accomplished fact to-day, it should not be forgotten that it has only entered upon its career of usefulness. It must be evident to all who have had experience in similar undertakings that the most precarious moment of its existence has passed. Its beginning is a small one, to be sure, but it is not one to be ashamed of. A library like this, is liable, at the first glance, to deceive the spectator with regard to its magnitude. The books are mostly large and costly, and do not make such a display on the shelves as would a collection of miscellaneous books costing the same amount of money. A fine-art library cannot be prepared with that of any other specialty. It can never be very large in number of volumes, if judiciously selected; for there is a limit to the number of really useful books on the subject. It is only the accumulation of the antiquities and curiosities of the whole field of fine-art literature that can give it anything approaching the enormous bulk of the great miscellaneous libraries. The Committee on Library and Publications of the Institute, in preparing a list of books recommended to be purchased, in 1867, designated only one hundred and thirty-two works, exclusive of periodicals, and amounting to less than three hundred volumes. The estimated cost of these books, duty free, was $5,000. This list, in view of the extant illustrations and descriptions of all the industrial and decorative arts cognate to the art of architecture, is, of course, a mere skeleton; but it comprises such a selection of the works then published as was thought sufficient for the nucleus of a library of architecture. We should have the means to purchase all these books now, and it is probably not too much to say that, if all the members of the Chapter would work for the cause, the money would be forthcoming in a short time. There is no doubt in the minds of your committee, that not only that sum, but a much larger one will eventually be raised, which will enable our successors to carry out its schemes in full, to secure the costly illustrations required for our shelves, and to supplement them by a museum of casts and models. Money, however, is wanted now, at the outset of the enterprise. Thus far, your committee, in view of the great difficulties of their enterprise, have great reason to congratulate the Chapter and themselves on the results thus attained."

That a good library of architectural works is much needed in this city, is a fact which is painfully obvious to every one that has had occasion to use one. It is true that we boast of our Astor Library, and we presume that many persons are so far deluded as to suppose that it is equal to every requirement. The fact is, however, that the Astor Library is perhaps quite as remarkable for its deficiencies as for its riches. Very many of the best works in science and art have found no place upon its shelves. One cause of this may be that these works are expensive. The three hundred volumes, or less, which now compose the Architectural Library of the City of New York cost five thousand dollars—an average cost of over nineteen dollars per volume. We believe that according to the first report, the average cost of the volumes in the Astor Library was *one dollar*. Moreover, we have heard it stated, and have no reason to doubt the truth of the insinuation, that the proclivities of the present managers of the library tend altogether too strongly in the direction of German literature to allow us to have any hope of seeing it make much progress in the direction of practical and scientific subjects during the lives of those of us who have unfortunately passed the summer solstice of life. We do, therefore, most earnestly hope that the citizens of New York will not withhold the twenty thousand dollars which the architects of New York assure us will suffice to give us a really useful working library of architectural works.

The Coal Business of Pittsburgh.

Many of your readers, no doubt, have only a vague idea of the coal business of Pittsburg, and of the vast bituminous fields in its vicinity. The country around Pittsburgh and Allegheny City, and in the vicinity of the Allegheny and Monongahela rivers, is one vast coal region, dotted with seams or veins of coal. There are seventy-seven coal mines on the bank of the Monongahela river alone, between Pittsburgh and Brownsville, or about one located every mile. The product of these mines is not less than 3,000 bushels each per diem, or over 40,000,000 bushels for the average working season; and these regular mines are independent of hundreds of small coal beds scattered all over this Congressional district. The exports last season were nearly 50,000,000 of bushels; and the shipments of coal for 1869 up to the present time, by rail and steamer, foot up 5,869,000 bushels; 1,809,000 of which have been sent to Cincinnati, 229,000 to Louisville, 680,000 to New Orleans, 270,000 to Memphis, 13,000 to Cairo, and 100,000 to Nashville, Tenn. Last week, over 1,000,000 bushels were shipped to Southern ports; and this week, should the river attain a coal rise, 1,000,000 more bushels will be ready for shipment. The coal fields around Pittsburgh embrace 15,000 square miles, or 8,850,000 acres. The whole amount shipped for the last twenty-four years from this port up to July 1, 1869, will exceed 200,000,000 of bushels.

The mines about Pittsburgh contain very few deep shafts, being mostly surface mines, and the ventilation is, as a general thing, sufficient, so that mining is not as dangerous here as in the anthracite regions of the State. Fire-damp and black-damp, therefore, is not common, although within the last six years several deaths have taken place in mines from this cause. There are but few Welsh miners here; mostly Americans and a few Irishmen work the mines; many of the men being forehanded and quite intelligent. Notwithstanding the abundance of "black diamonds" which exist here, the price is advancing. This is unnecessary. New mines are opened daily, and the cost of mining, weighing, labor, and shipping, does not exceed four cents per bushel; at least, such is the report of the miners. It is sold at the mines at 7½ to 8 cents per bushel, and by the time it reaches the hands of the dealer it brings from 12 to 14 cents; and to-day the dealers are talking of advancing the price to $5 per ton. This is simply outrageous, in a coal country like this; and what must it be to distant places, after counting freights and commissions to dealers.—*Corres. Evening Post.*

Peat in Canada.

OUR Kanuck neighbors are manifesting considerable energy in the introduction of peat as fuel. We notice that the Anglo-American Peat Company, with a capital of $200,000, announces that it will be able to manufacture this year from ten to twelve thousand tons of good fuel, and claims that this will be accomplished at a cost of less than $1 45 per ton, and that the quality of the product will be equal, for domestic purposes, to that of wood or coal, while, for steam purposes, one ton of it will be superior to one cord of wood, in the proportion of 31 to 27. Another company, the Ontario, owning 1,375 acres of land in the county of Welland, is organized with a capital of $120,000, and proposes to commence operations soon.

What has become of the peat companies that made such a flourish in this State and New Jersey a year or two ago? Has the peat "peatered out," or is there something the matter with the process, or are the paper certificates of stock so abundant as to injure the market for cheap fuel?

A Miners' Riot in France.

THE Paris *Journal Officiel* has the following: A very formidable riot broke out among the miners employed by the Orleans Railroad Company, in the Department of the Aveyron, on Thursday, October 7. The rioters attempted to drown the chief engineer of the company in a neighboring river, but were frustrated by the efforts of the prefect and the troops under his command. The vice prefect and several other persons were wounded in the *mêlee*. During the same night the miners fired the general store-houses and other buildings of the company in that neighborhood, and by the next morning the riot had assumed alarming proportions. The miners, in large force, attacked the forges of the company, but the military, which meanwhile had arrived on the ground, charged upon them, and at the same time used their fire-arms. Ten of the rioters were killed outright, and many others wounded, and the mob were dispersed. Measures have been taken by the authorities to guard against any new outbreak.

Convention of Locomotive Engineers.

AT the sixth annual convention of the locomotive engineers in the United States, recently held in Baltimore, large numbers of delegates from nearly all the States and from Canada were present. Charles Wilson, Grand Chief Engineer of the Brotherhood, delivered a lengthy address, congratulating the convention on the advancement of the Brotherhood since the last annual session. During the year, fourteen charters were granted for new divisions. The address was chiefly devoted to the objects of the association, namely, to elevate the standing and improve the efficiency of locomotive engineers. He recommended total abstainence from all that can intoxicate as the only safe and consistent ground for the Brotherhood. The Mast Hope disaster on the Erie Railway was reviewed, and the causeassigned that the engineer had been running two successive nights without sleep. The address was ordered to be published.

Surveying by Photography.

HERR MEYDENBAUER, a Berlin photographer, has recently measured distance and drawn out plans and maps by photography. With much trouble he succeeded in convincing the Prussian Government of the correctness of his theories, and was commissioned to survey a fortification. The task was beset with innumerable difficulties, which, for the most part, sprang from the defective nature of the instrument. In six months, however, he had succeeded in obtaining 800 plates, and in doing so had gained invaluable experience, so that he met with no great difficulty in completing a photogrammetric instrument of such simplicity that a workman quite unacquainted with the art was able to draw up a special plan of a fortress on the scale of 1 to 2,500 after a few short instructions.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

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Our Bullion Product.

IF our Mining Summary this week will be found a statement of the product of bullion in the Pacific States and Territories for the nine months ending with the first of October. The receipts of treasure at San Francisco for this period have been about thirty-seven and a half million dollars, slightly in excess of the same months of 1868, and some two millions less than those of 1867. But this sum must be decreased by the subtraction of over ten millions received in coin, and more than offset by the shipment of fifteen millions to the interior from San Francisco. The similar movement of coin during the first nine months of 1868 was but slightly over five millions received and nine millions returned. Making the necessary corrections, we have a receipt of uncoined treasure through the express companies of twenty-seven millions this year against thirty-two millions the year before.

There is no doubt that this indicates a diminished production of bullion for the calendar year 1869; but we do not anticipate that the decrease will be very large; and, on the other hand, the well-known causes of it are such as not to discourage us in view of the future. The San Francisco *Commercial Herald* judiciously remarks that the falling off in bullion product is attributable to the diminished yield of the Washoe mines, largely due to the great fire in the Crown Point, Kentuck, and Yellow Jacket; to the unusual lack of water in the placer camps; and to the numerous miners' strikes in various quartz districts.

At present, however, the prospects of the Comstock mines are improved; the production of White Pine is large and regular; the dry weather has delayed, but not destroyed, placer and hydraulic operations, and what we do not receive this year from those sources will come when the water comes. As for troubles arising from the high wages and exorbitant demands of laborers, all delay from that cause is a loss of interest on capital, and little more. When the labor question shall have been settled on a fair basis, the activity and productiveness of the gold and silver mining industry will be multiplied, and the dividends of profit will be more likely to find their way into the hands of owners and capitalists than into those of their employers.

We do not feel alarmed, therefore, at the temporary decrease of production. Part of it will be made up by the end of the year; and in any event, the treasure that we do not extract from the earth is not therefore lost. It is *waste*, not diminished aggregate of yield, that should alarm us. Waste by litigation, by reckless mining and imperfect extraction, by swindling speculation and premature development—this should receive constant attention and remedy. In no other way can we secure a permanent and healthy increase of our bullion product.

Gold Mining in Idaho.

IDAHO, like most of the Pacific mining districts which depend mainly upon placers for their production of gold, has suffered severely from the extraordinary lack of water during the present season. Indeed, it may almost be said that there has been no season this year at all, so early did the streams upon which the miners rely fail to supply water sufficient for the ditches and sluices. There has been a little bar-mining rendered possible by the low water in the Snake, Boise and other rivers; but we have heard of nothing remarkable in the way of profits from this source. Probably it has merely paid small wages to a few men who were willing to adopt this method of occupying the time until either fall rains or spring thaws should enable them to return to their more remunerative claims. This state of things is always favorable to new discoveries. The active and enterprising pioneers in the mining regions, when they are forced to leave their regular employment, generally start out on prospecting tours. It is actual economy to take a horse, a pair of blankets, and a few supplies, and travel in the mountains for a few weeks, rather than remain in Boise or Idaho City, paying board—possibly losing money at cards, and earning nothing. When work slacks and trade is dull, the knowing ones begin to prophesy new discoveries, and this will no doubt continue to be the case as long as any considerable portion of our inland basin and Pacific slope remains unexplored.

Another circumstance, favorable to such discoveries, is the termination, last year, of a long and vexatious Indian war in Idaho and Eastern Oregon. The bitterly hostile bands of outcast Shoshones and other tribes which infested the Owyhee, Powder river, and Snake valleys, rendered it dangerous for small parties to traverse those regions, and almost impossible for them to stay long in any one locality, and pursue the peaceful work of discovering and testing metalliferous deposits. The vigorous and persevering policy of Gen. CROOKE, who is perhaps the best Indian fighter in the United States Army, brought the war to an end, and broke, we think forever, the power of the savage enemy. We regret to see that some depredations have recently occurred in Idaho; but in view of the overwhelming defeats and losses sustained by the Indians during the CROOKE campaign we cannot believe that any serious trouble will again arise in that quarter. At all events, a large area of territory has been open to exploration during the past summer, and prospectors have doubtless made good use of the opportunity. Many of the reports brought in by prospectors, under such circumstances, are no doubt colored by the sanguine temperaments of the parties. Only hopeful men can bear the fatigues and hardships of such expeditions. Their glowing stories fall upon the ears of many who have for the time nothing to do, and to whom a journey of a few hundred miles in the wilderness is but a trifling labor, if not actually a pleasure. The merchants, also, whose goods are lying on their shelves, unsold, by reason of the cessation of active mining operations, look with favor upon anything which will create "a little excitement," and revive business. They can at least send off and dispose of a few wagon loads of otherwise unsaleable merchandise, before the real value of the new Eldorado has been determined.

Making allowance for all these sources of exaggeration and error, however, we think some of the reported discoveries of the present year in Idaho will prove important. The diggings on Loon Creek have attracted much attention, and will probably produce, next year, considerable gold. And finally, it must be borne in mind that all these alluring, but comparatively short-lived, surface operations are but preliminary to the discovery and exploitation of quartz veins, in which Idaho is, we are persuaded, by no means deficient.

Captain Pshaw.

WE published last week a report of the views said to have been expressed by Captain SHAW, the chief of the London Fire Brigade, concerning the fire departments of the United States. We regret to notice that this meritorious officer speaks with something very like contempt of our expensive and elaborate organizations, unwieldly steam-engines, elected engineers, lack of hand-engines, and general inability to instruct him on any points whatever.

It is worth while to know what other people think of us; and if we want friendly criticism (which, as everybody knows, is the sharpest kind), we are sure to get it from England. The *Fireman's Journal*, a handsome New York publication, representing the Metropolitan Fire Department, is rather severe on the Captain, intimating a doubt whether he ever said what is reported of him, and a conviction that, if he did say it, he don't know much. To impartial outsiders, however, the remarks of the London chief seem to contain many practical, sensible, and true observations. None of these is more worthy of consideration than the statement that political influences are seriously detrimental to the efficiency and progress of our fire-engineering. Politics may light conflagrations, but something else is required to put them out. The use of politics in this department fairly belongs in the same category with a patent pain-killing compound which we once saw advertised under the startling title, "Smith's Inflammatory Annihilator."

Gram or Gramme?

LONG ago, in a paragraph under this caption, we pointed out the danger, approaching to inevitability, of typographical errors involved in the use of the anglicized orthography "gram" for the metrical weight "gramme," and based upon that fact an appeal in behalf of the retention of the French method of spelling the word. It was, and is, our intention to conform the usage of the ENGINEERING AND MINING JOURNAL to this rule; but occasionally we send to the printer without minute revision the manuscript of some distinguished contributor, whose practice in this respect does not conform with our own. An unfortunate but striking instance of the unwisdom of using "gram" for "gramme" occurred in our columns last summer, during the absence of the editor-in-chief. An interesting article by Professor CHANDLER, of the Columbia College School of Mines, on the new system of assay weights in use at that school, was defaced throughout by the use of the word "grain" wherever "gram" *alias* "gramme," was written by the author; and this error quite naturally escaped the notice of our proof reader, to whom "grain" was a familiar term, and "gram" an unknown monstrosity. The context was in most cases sufficient to show the real meaning to the intelligent reader; but the confusion thus caused was sufficiently vexatious to both author and publisher. We mention the matter, at this late day, to add force to our repeated request that our contributors avoid a usage so fruitful of mistakes. We hope scientific men generally will bear in mind that the difference between "grain" and "gram" is considerable, while the difference between "gram" and "gramme" is trifling. Of two evils, choose the least, particularly if it isn't an evil.

Metric Weights and Measures.

A REPORT on the subject of the construction of primary international standards of metric weights and measures has recently been made to the Imperial Academy of Sciences at St. Petersburg, by a commission of members of the Academy appointed to consider the matter. The commission, which consisted of MM. Struve, Wild, and Jacobi, regard as an accomplished fact that all civilized nations have tacitly agreed to recognize the French metric system as affording for the future the advantages of a universal system of weights and measures, and to adopt the standards deposited at the Palais des Archives at Paris as the primary units of this system; but they observe that these are French standards, and all countries adopting the metric system are now compelled to apply to the French Government for permission to obtain copies. It is true that this permission is never withheld, but such copies are not compared directly with the standards of the Archives, but with duplicates at the Conservatoire Impérial des Arts et Métiers. The commission consider this course of proceeding unsatisfactory, and they propose that an international commission be nominated, composed of delegates from all civilized countries, for the construction and verification of primary international standards of measures of length, weight, and capacity at the base upon which a universal system may be definitely established. They should also superintend the construction and verification of copies of these primary standards for the several countries.

Painful, but Necessary.

IT is the unpleasant duty of the publishers of the ENGINEERING AND MINING JOURNAL to request parties who write to obtain odd numbers, enclosing the sum of ten cents therefor, to address their letters to WESTERN & Co., and not to the editor. The eccentricities of genius, and the size of the editor's overcoat-pocket, are so great, that small communications of the character referred to are too frequently lost sight of by that otherwise (we hope) upright and conscientious individual. In justice to him, it should be added, that, conscious of some possible weakness in this direction, he desires to be delivered from ten-cent-temptations.

Horse-Power.

A CORRESPONDENT, who appropriately subscribes himself with the somewhat elementary initials, "A. B. C.," inquires "whether we can" give him the "rule or process employed in calculating the horse-power of the steam engine." The vagueness of this phrase leaves it undecided whether nominal or indicated horse-power is desired. This distinction is important, since the indicated power of engines ranges from one to six times the nominal power, and even higher. The nominal horse-power is deduced from dimensions, the indicated horse-power depends directly on the pressure of steam and the velocity of the piston. Now, if our correspondent desires the rule for calculating nominal power, he should know that there are different rules for different sorts of engines. RANKIN gives one for condensing and one for non-condensing engines, together with the rule adopted by the British Admiralty, and applicable to screw-propeller engines only. The rule for non-condensing engines is to multiply the cube root of the stroke in feet by the square of the diameter of the cylinder in inches, and divide by 20. But the nominal horse-power thus obtained is a quantity without much practical significance, since it does not include as a factor the actual effective pressure of steam. On the other hand, the actual power of an engine in operation may be calculated as follows: Find the mean effective pressure of steam behind the piston. This is usually about eight-tenths of the pressure calculated from the indicator-diagram. Multiply this pressure, expressed in pounds per square inch, by the area of the piston, expressed in square inches. The result is the pressure or weight constituting the load upon the piston. This load, multiplied into the number of feet travelled by the piston per minute, gives the number of foot-pounds per minute developed by the engine; and as 33,000 foot-pounds per minute constitute a horse-power, the actual horse-power can be ascertained by using that figure as a divisor.

We have frequently had occasion to explain this subject and we should be justified in refusing to pay any attention to queries which any manual of mechanics would abundantly answer; but the *naive* doubt of our alphabetic friend above quoted, whether we could give him the information he requested, led us to fear that our neglect to do so would be set down to our weakness in the face of so formidable a problem. Let it hereafter be understood that we *can* give elementary formulæ, but that we modestly shrink from doing so, even to save some sharp subscriber the cost of a school-book.

Chromium.

SEVERAL packages of chromium have been received by the Commissioner of the General Land Office from various parts of the United States. The metal chromium is not found in its native state, and as its isolation is very difficult, the properties have not as yet received the desired attention by scientific men which they deserve, to be well understood. The chief combination is the chromate of iron, or chromic iron, in which state it occurs in nature's laboratory. It occurs only in serpentine rocks, either in veins or imbedded masses, and the only known localities of its occurrence are Siberia; Roeras, in Norway; Isle a'Vaches, in San Domingo; Bare Hill, near Baltimore, Md.; Chester and Lancaster counties, in Pennsylvania; Hoboken, N. J.; Jay, Troy and Westville counties, in Vermont; and Chester and Blandford counties, in Massachusetts, reputedly. A few years ago it was found to exist near Mexico, Cecil county, Maryland, and recently specimens eave been received by the Commissioner from Ortiz Grant, New Mexico.

In the beginning of the century the ores of chromium possessed merely a scientific value, but are now largely employed in various important arts and industries. The variegated color of verd' antique marble is chiefly derived from this mineral. The bichromate of potassa is the chief technical product of all the important compounds of chromium; the same are used in the manufacture of yellow, red and green paints. Oxide of chromium has been introduced in dyeing and in calico printing, and is able to furnish green, violet or red colors, according to the quantity in which it is solved and applied in various alkaline sulphides.

The oxide of chromium supplies also a beautiful green for porcelain painting; the so-called pink color similar to the bright lakes derived from madder, finds application in the manufacture of fayence-ware. The chloride of chromium, which appears in red crystalline micaceous folia, might also find application in coloring wall paper. Gentile, a prominent chemist, disovered in the triple sulphate of chromium a rare color, which appears green by means of artificial light. The mixture of the chromic iron with common iron has recently found application by the American Tool Steel Company, in Brooklyn, for the manufacture of steel. Another valuable adaptation for the oxide of chromium in the United States as well as in Europe, is the production of artificial gems and aventurine glass.

The New Slate Market.

THE immense increase in demand for slate renders all information relative to its supply of interest. The San Francisco *Mining Press* has the following, which bears upon the slate supply from the Pacific:—"The present, and the first public exhibition in this State of the products of our slate quarries (by Mr. Robinson, of the California Slate Company, whose quarry is in Copperopolis) is eminently suggestive of what this new business may in time become. The attention of the public being once interested in this direction, will induce many others to look into the business, and a free supply of the product can scarcely fail to greatly extend its use and demand. Few have any idea of the large fortunes annually made out of this branch of industry in Great Britain. The slate quarries of that country are mostly confined to North Wales, and some of the quarries there divide annually from two to three hundred thousand dollars. There is one quarry which has been profitably worked for over fifty years, and which was sold some three years since for $600,000. This has also become an important and profitable business in the Atlantic States. This class of investment is attended with but little risk—not a tithe of that incident to mining for the precious metals, or for copper or tin. The color, cleavage, and grain of the California slate appears to be all that is desirable, and we presume that it will not be long before the quarry proprietors will find it to their advantage to erect extensive sawing and dressing machines. There is already a second quarry opened, not far from the one which is now making such a fine exhibition of its products at the Mechanics' Fair."

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" The elasticity of
" The weight of
" The nature and quality of
" Why some mines generate and produce more than others
" Why some mines generate a mixture of
Goaf, or gob, how tramrods are made through (plan)
Lund-hill (plan)
Managers, who are best competent to manage mines
Miscellaneous questions
Natural ventilation
Planning, how workings are laid on the plan
Regulations (see R on plans)
Safety Lamps, why flame will not penetrate through, engraving of
Sections on mechanical ventilation
Summary of accidents
Surveying, how mines are with the dial
Surveying, how mines are with the theodolite
Tables of weights and measures
Temperature on surface
Temperature in mines
Temperature, difference of between down and up-cast
Theodolites for mine surveying
Theodolites, how constructed
Theodolites, the magnetic needle dispensed with, and how workings are laid on plan, with Theodolite surveying
Theodolites, how mines are surveyed with them
Up-cast larger than down-cast (plan)
Ventilating mines by mechanical power
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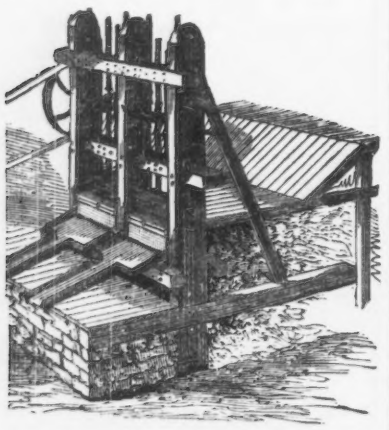

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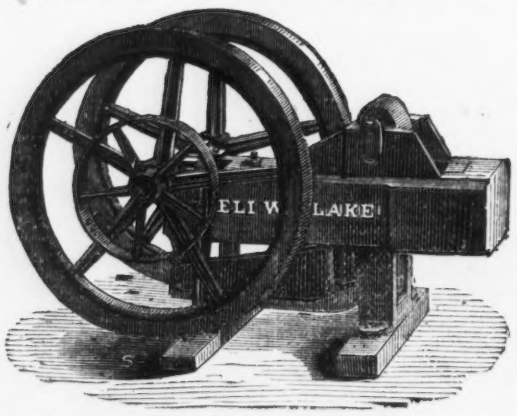

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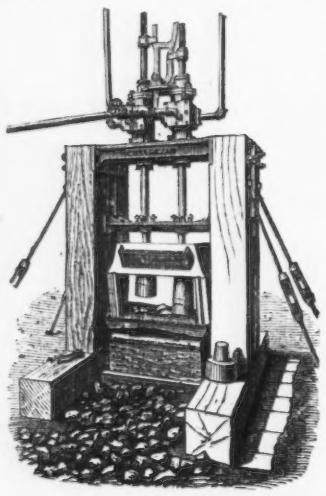

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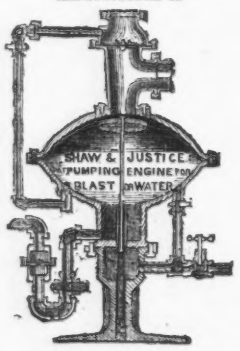

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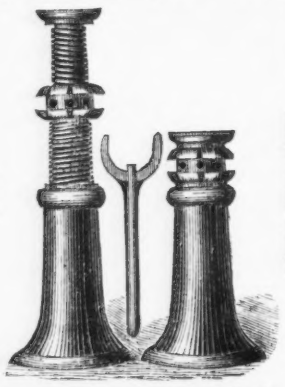

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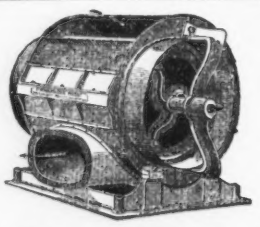

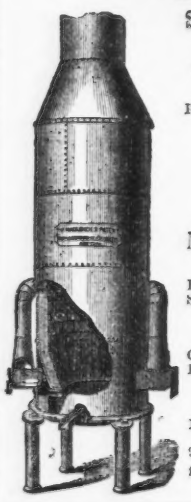

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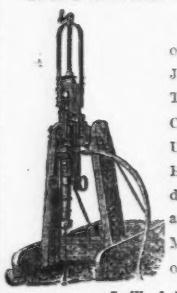

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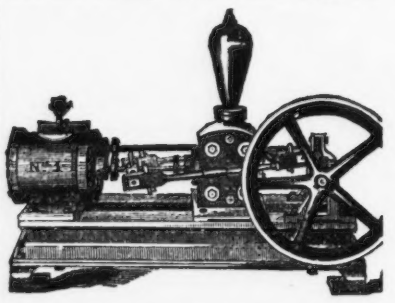

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Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

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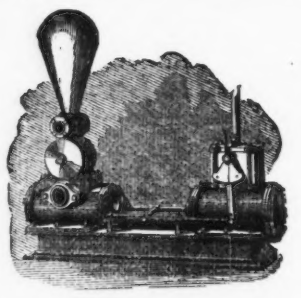

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Steam Pump and Fire Engine.

Patented in England, Belgium and France. Send for circular. feb-13-1y

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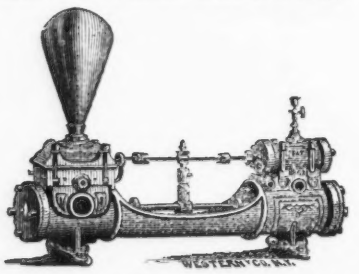

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Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical
MINING PUMPS
(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter.)

Pumps for every possible duty, and all fully guaranteed. Also,

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Sole Proprietors and Manufacturers
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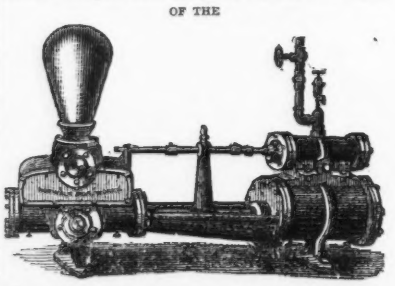

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(Patented in the United States, France, England and Belgium.)

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STEAM AND BLOWING ENGINES,

Pumping Engines for Water Works, Horizontal and Tumbling Beam Engines, Mining, Wrecking, and Supply Pumps.

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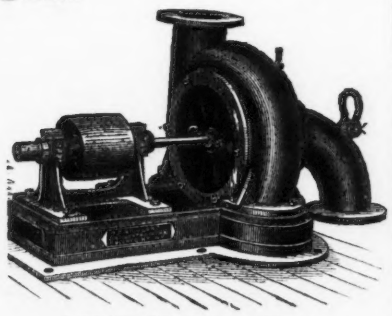

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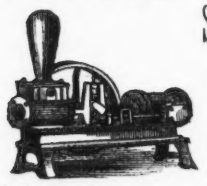

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Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

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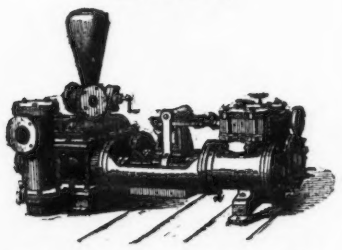

Water Meters, Oil Meters; Water Pressure Engines; Stamp Mills for Gold, Silver and Copper Ore; Eaton's Patent Amalgamators for Gold and Silver; Steam and Gas Pipe, Valves, Fittings, etc. Iron and Brass Castings.

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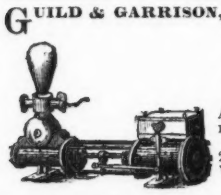

Steam Pomps, Vacuum Pumps, Steam Engines, Vacuum Pans,

And all the various connections. For sale at the STEAM PUMP WORKS, 26, 28 and 30 First street, Williamsburgh, N. Y.

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AIR PUMP,

COMPRESSES AIR OR GAS TO ANY REQUIRED PRESSURE.

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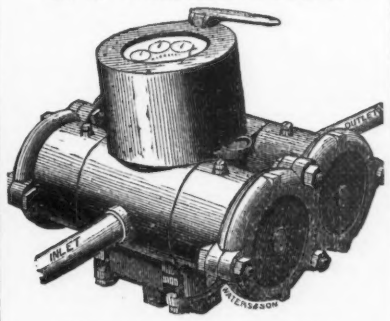

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This Meter is also Used for the Measurement of Oil.

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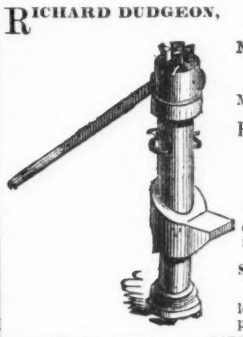

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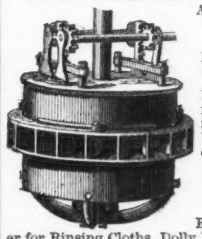

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WATER WHEELS,

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Also Iron Founders. Every description of Casting furnished at short notice. All Machines and Castings furnished at this establishment warranted.

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OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

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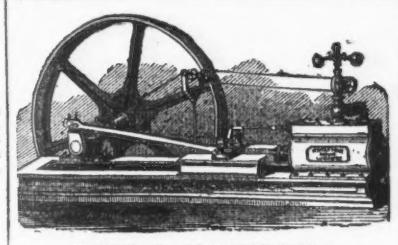

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MACHINERY MERCHANTS, ENGINEERS, AND MACHINISTS,

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Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson & Snow's Patent Governors constantly on hand.

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T. S. POST & Co., Benham, Texas, say: "Since using Winans' Powder, we save ONE cord of wood per day (one-half our fuel), and have better steam, and would not be without the article for ten times its cost."

The Cleveland (Ohio) Paper Mills removed scale 22 inches long by 9 wide and 1¼ inch thick.

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PATENT FIRE CORRUGATED

IRON SHUTTERS AND DOORS,

MANUFACTURED EXCLUSIVELY BY THE

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We particularly invite the attention of owners of buildings and Insurance companies to an examination of these Shutters and doors, which are unequalled as protectors against fire.

Practical tests have demonstrated their superior ability to resist heat, over the flat iron shutters and doors of the best and costliest kind.

As is well known, flat iron shutters will warp from heat of fire, and often of the sun.

Our Shutters *will not warp* under any circumstances. They are stiff, strong, light, and ornamental, being made to fit with exactness any opening, and particularly easy to handle, they can be used in many places where heavy shutters are impracticable.

Among our specialities in doors are

CAR-HOUSE AND ENGINE-HOUSE DOORS, HEATER DOORS, VAULT DOORS.

We deliver and hang all our doors and shutters at any point.

Their cost is less than that of any other fire iron door or shutter.

Send for circulars and further information.

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We are erecting buildings for all purposes.

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Our Iron Covering is acknowledged as being the best for any building, having all the dryness of wood and the durability and warmth of brick.

It meets the requirements of any city fire law, and its cost is much less than that of brick.

Plans and specifications, with estimates, furnished upon application.

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Sixteen years of use has demonstrated that our

Patent Elastic Joint Iron Roofing

is superior to any Roofing now in use. It is put on without any nails or any solder in the roof itself, and full allowance made for expansion and contraction. Every variety of building has been covered with it in the last few years, with most satisfactory results. We are prepared to furnish and lay the roofing, in any quantities to suit, at short notice. july-20-tf

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(Foot of East Twelfth street.)

BRANCH OFFICE, NOS. 77 AND 83 LIBERTY STREET,

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OF ALL KINDS.

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THE STEAM GENERATOR

Manufacturing Company of Penn.

This Company is now prepared to furnish

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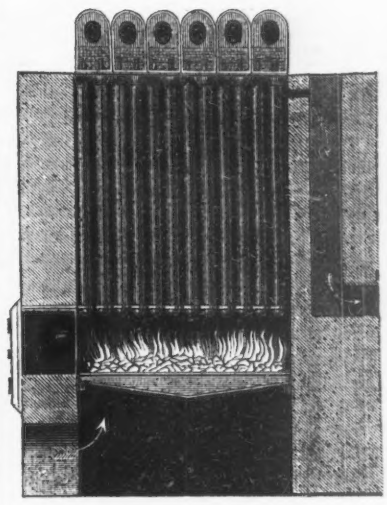

Patent Improved Steam Generator,

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

Safety from Destructive Explosion.

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

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SAFETY BOILER.

Over 100 sold—tested to 300 lbs., no large sheet-iron shell to explode. Economical and durable. All sizes on hand. Also, Steam Engines, Steam Pumps, etc. Send for pamphlets and price lists.

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CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established.

Also,

EMERSON'S PATENT PERFORATED CIRCULAR AND LONG SAWS,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

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Saw Mills, Saw Arbors, Scroll Saws; Railway, Cut-Off, and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

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Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

june5-tf FITCHBURG, MASS.

RAILROADS.

LEHIGH & SUSQUEHANNA RAILROAD.
(LEHIGH COAL AND NAVIGATION CO.)

Summer Arrangement.

On and after Monday, July 12, 1869, Passenger Trains on the Lehigh & Susquehanna Railroad will run as follows :

DOWN TRAINS.

	No. 1. A.M.	No. 3. A.M.	No. 5 P.M.	No 7. P.M.
Leave Green Ridge	9:05	7:00	1:00	5:15
Scranton	9:10	7:05	1:05	5:20
Pittston	9:36	7:35	1:35	5:52
Wilkesbarre	10:00	8:00	2:00	6:17
White Haven	11:23	A.M.	P.M.	P.M.
				No. 9.
Mauch Chunk	12:00			A.M.
	1:03			6:50
Catasauqua	2:01			8:04
Allentown	2:10			8:15
Bethlehem	2:20			8:30
Easton	2:48			9:05
Phillipsburg	2:52			9:10
Philadelphia	4:45			A.M.
Arrive New York	6:30 C.R.R.			
	9:40 M. & E.R.R.			
	P.M.			

UP OR NORTHWARD TRAINS :

	No. 2. P.M.			No. 10 A.M.
Leave New York	9:00 C. R. R.			
	8:30 M. & E. R.R.			
Philadelphia	9:45			
Phillipsburg	11:50			7:00
Easton	11:55			7:04
Bethlehem	12:23			7:36
Allentown	12:36			7:50
Catasauqua	12:53			8:04
Mauch Chunk	2:05			9:20
		No. 4.	No. 6.	No. 8.
White Haven	3:23	A.M.	P.M.	P.M.
Wilkesbarre	5:00	8:30	2:25	6:45
Pittston	5:25	8:55	2:50	7:10
Scranton	5:56	9:26	3:20	7:40
Arrive Green Ridge	6:00	9:30	3:25	7:45
	P.M.	A.M.	P.M.	P.M.

Connections.

DOWN TRAIN No. 1, makes close connection at Penn Haven with Lehigh Valley Railroad, for Beaver Meadow, Hazleton and Mahanoy City.

DEL. & HUDSON CANAL CO., R.R.—Up trains Nos. 4 & 6, and down trains Nos. 1 and 7 connect at Green Ridge with trains on Delaware & Hudson Railroad, to and from Carbondale.

NORTH PENNA. R.R.—Down train No. 1, and up train No. 0 connects at Bethlehem with trains on North Pennsylvania R.R., arriving at Philadelphia at 4:45 P.M. Returning, leave Philadelphia for Scranton, Wilkesbarre and Mauch Chunk at 9:45 A.M.

LEHIGH & LACKAWANNA R.R.—Down train Nos. 1 and 0, and up train Nos. 2 and 0 connect at Bethlehem with Lehigh & Lackawanna R. R. for Bath and Chapman Quarries. Returning leaves Bath at 7:00 A.M.

MORRIS & ESSEX R. R.—Down train No. 1 and 0 connect at Easton with Morris & Essex Railroad for Newark and New York. Returning leave New York (Barclay street,) for Scranton, Wilkesbarre and Mauch Chunk at 8:00.

CENTRAL RAILROAD OF NEW JERSEY.—Down trains Nos. 1 and 9 connect at Phillipsburg with trains for New York. Returning, leave New York (foot of Liberty street,) for Scranton, Wilkesbarre and Mauch Chunk at 9:00 A. M.

BELVIDERE & DELAWARE R.R.—Down train No. 0 and up train No. 2 connect at Phillipsburg with Belvidere & Delaware Railroad to and from Trenton and Philadelphia.

MENDES COHEN,
Superintendent.

LEHIGH VALLEY RAILROAD.

—ON AND after June 1, 1869, trains on the Lehigh Valley Railroad will run as follows :

DOWN TRAINS.

	A.M	P.M.
Leave Tunkhannock	6 20	
L. & B. Junction	7 30	1.15
Pittston	7.40	1.25
Wilkesbarre	8.00	1.45
White Haven	9 25	3.08
Mauch Chunk	10.35	4.20
Allentown	11.43	5.50
Bethlehem	11 55	6.05
	P.M.	
Easton	12.25	6 35
Philadelphia	2.10	8.35
Arrive New York	3.50	9.00

UP TRAINS.

	P. M.	M.
Leave New York	6.50	12.00
		P. M.
Philadelphia	7.45	1.45
Easton	10.00	3.25
Bethlehem	10.30	4.00
Allentown	10.45	4.20
	M.	
Mauch Chunk	12.00	5.45
	P. M.	
White Haven	1.32	7.18
Wilkesbarre	2.50	8.35
Pittston	3.10	8.55
L. & B. Junction	3.20	9.05
Arrive Tunkhannock	4.30	

☞ No change of cars between Scranton and New York, or between Scranton and Philadelphia.

ROBERT H. SAYRE, Sup't and Eng.
H. STANLEY GOODWIN, Ass't Gen. Supt.
June 1, 1869.

DELAWARE, LACKAWANNA & WESTERN R. R.—Morris & Essex Division.

Summer Arrangement,

Commencing Monday, April 5, 1869, and running on the following time until further notice.

	L. and Express. A. M.	Scranton. Mail. A.M.	Scranton, Express. P. M.
Leave Easton	6.55	11.30	5.30
Washington	7.28	12.10	6.15
Hackettstown	7.48	12.36	6.45
Dover	8.30	1.24	7.30
Rockaway		1.34	
Morristown	9.00	2.00	8.00
Orange		2 50	8.50
Newark	9.50	3.00	9.00
Arrive New York	10.25	3 35	9.40
	A.M.	P. M.	P.M.

RETURNING.

	P. M.	A. M.	A.M.
Leave New York	4.00	7.00	8.30
Newark	4.40	9.05	7.40
Orange			7.53
Morristown	5 33	10.00	8.45
Rockaway			9.09
Dover	6.00		9.20
Hackettstown	6.42	11.05	10.08
Washington	7.02	11.25	10.53
Arrive Easton	7.35	11.57	11.10

Connections.

At Washington, with Delaware, Lackawanna & Western Railroad, for Water Gap, Stroudsburg, Wilkesbarre, Carbondale, Scranton and Great Bend.

At Easton, with Lehigh Valley and Lehigh & Susquehanna Railroads for Bethlehem, Allentown, and Mauch Chunk.

S. SCHOCH,
R. A. HENRY, Ass't Superintendent.
Gen. Passenger Agent.
Hoboken, N. J., April 21, 1869.

RAILROADS.

READING RAILROAD.

—GREAT TRUNK LINE from Philadelphia to the interior of Pennsylvania, the Schuylkill, Susquehanna, Cumberland and Wyoming Valleys, the North, Northwest, and the Canadas.

Summer Arrangement of Passenger Trains, July 12, 1869.

Leaving the Company's Depot, Thirteenth and Callowhill streets, Philadelphia, at the following hours :

MORNING ACCOMMODATION.

At 7.30 A.M. for Reading and all intermediate stations and Allentown. Returning, leave Reading at 6.30 P. M., arrive in Philadelphia 9.15 P.M.

MORNING EXPRESS.

At 8.15 A. M., for Reading, Lebanon, Harrisburg, Pottsville, Pinegrove, Tamaqua, Sunbury, Williamsport, Elmira, Rochester, Niagara Falls, Buffalo, Wilkesbarre, Pittston, York, Carlisle, Chambersburg, Hagerstown, &c.

The 7.30 A. M. train connects at READING with East Pennsylvania Railroad trains for Allentown, &c., and the 8.15 A.M. train connects with the Lebanon Valley train for Harrisburg, &c.; at PORT CLINTON with the Catawissa Railroad trains for Williamsport, Lock Haven, Elmira, &c.; at HARRISBURG with Northern Central, Cumberland Valley, and Schuylkill and Susquehanna trains for Northumberland, Williamsport, York, Chambersburg, Pinegrove, &c.

AFTERNOON EXPRESS

Leaves Philadelphia at 3.30 P.M. for Reading, Pottsville, Harrisburg, &c., connecting with Reading and Columbia Railroad trains for Columbia, &c.

POTTSTOWN ACCOMMODATION

Leaves Pottstown at 6.25 A.M., stopping at intermediate stations; arrives in Philadelphia at 8.40 A. M. Returning, leaves Philadelphia at 4.30 P. M., arriving in Pottstown at 6.40 P.M.

READING ACCOMMODATION

Leaves Reading at 7.30 A.M., stopping at all way stations; arrives in Philadelphia at 10.15 A.M.

Returning, leaves Philadelphia at 5.15 P. M.; arrives in Reading at 8.00 P.M., and connects with Market Train for Pottsville.

Trains for Philadelphia leave Harrisburg at 8.10 A.M. and Pottsville at 8.45 A.M., arriving in Philadelphia at 1.00 P.M. Afternoon trains leave Harrisburg at 2.05 P. M. and Pottsville at 2.45 P.M., arriving at Philadelphia at 6.45 P. M.

HARRISBURG ACCOMMODATION

Leaves Reading at 7.15 A.M. and Harrisburg at 4.10 P.M. Connecting at Reading with Afternoon Accommodation south at 6.30 P.M., arriving in Phildelphia at 9.15 P. M.

MARKET TRAIN, with a passenger car attached, leaves Philadelphia at 12.45 P. M. for Pottsville and all way stations; leaves Pottsville at 5.40 A.M., connecting at Reading with Accommodation Train for Philadelphia and all way stations.

All the above trains run daily, Sundays excepted.

Sunday trains leave Pottsville at 8.00 A.M. and Philadelphia at 3.15 P. M.

Leave Philadelphia for Reading at 8.00 A.M. Returning from Reading at 4.25 P.M.

CHESTER VALLEY RAILROAD.

Passengers for Downingtown and intermediate points take the 7.30 A.M., 12.45 and 4.30 P.M. trains from Philadelphia, returning from Downingtown at 6.10 A.M., 1.00 and 5.45 P.M.

PERKIOMEN RAILROAD.

Passengers for Skippack take 7.30 A M., 4 30 and 5.15 P.M. trains from Philadelphia; returning from Skippack at 6.15, 8.15, A. M. and 1.00 P. M. Stage lines for various points in Perkiomen Valley connect with trains at Collegeville and Skippack.

NEW YORK EXPRESS, FOR PITTSBURG AND THE WEST.

Leaves New York at 9.00 A. M. and 5.00 and 8.00 P.M., passing Reading at 1.05 A.M., and 1.50 and 10.19 P.M., and connecting at Harrisburg with Pennsylvania and Northern Central Railroad Express Trains for Pittsburg, Chicago, Williamsport, Elmira, Baltimore, &c.

Returning, Express Train leaves Harrisburg on arrival of Pennsylvania Express from Pittsburg at 2.35 and 5.20 A. M., 10.55 P. M. passing Reading at 4.30 and 7.05 A. M. and 12.50 P. M.; and arriving at New York at 11.00 A. M. and 12.20 and 5.00 P. M. Sleeping cars accompany these trains through between Jersey City and Pittsburg without change.

A mail train for New York leaves Harrisburg at 8.10 A.M. and 2.05 P. M. Mail train for Harrisburg leaves New York at 12 noon.

SCHUYLKILL VALLEY RAILROAD.

Trains leave Pottsville at 6.30 and 11.30 A. M. and 6 40 P.M., returning from Tamaqua at 8.35 A. M. and 2.15 and 4.15 P.M.

SCHUYLKILL AND SUSQUEHANNA RAILROAD.

Trains leave Auburn at 6.25 A. M. for Pinegrove and Harrisburg, and at 12.10 P.M. for Pinegrove and Tremont; returning from Harrisburg at 6.20 P. M., and from Tremont at 6.45 A.M. and 7.40 P.M.

CENTRAL RAILROAD OF NEW JERSEY.

—Passenger and Freight Depot in New York, foot of Liberty street; connects at Hampton Junction with the Delaware, Lackawanna and Western Railroad, and at Easton with the Lehigh Valley Railroad and its connections, forming a direct line to Pittsburgh and the West without change of cars.

ALLENTOWN LINE TO THE WEST.

Three Express Trains to the West, except Sundays, when one train in the evening.

Sixty miles and three hours saved by this line to Chicago, Cincinnati, St. Louis, &c., with but one change of cars.

Silver Palace cars through from New York to Chicago.

SUMMER ARRANGEMENT.

Commencing August 16, 1869.—Leave New York as follows :

6.55 A. M.—For Easton, Bethlehem. Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, Tukhannock,

7.15 A. M.—For Somerville.

8.30 A. M.—For Flemington, Junction, Stroudsburg, Water Gap, Scranton, Kingston, Pittston, Great Bend,

9 A. M.—WESTERN EXPRESS.—For Easton, Allentown, Harrisburg and the West, without change of cars to Cincinnati or Chicago, and but one change to St. Louis. Connects at Harrisburg for Erie and the Oil Regions. Connects at Junction for Stroudsburg, Water Gap, Scranton, &c. Connects at Phillipsburg for Mauch Chunk, Wilkesbarre, &c.

12 M.—For Flemington, Easton, Allentown, Mauch Chunk, Wilkesbarre, Reading, Columbia, Lancaster, Ephrata, Litiz, Pottsville, Scranton, Harrisburg, &c.

3.30 P. M.—For Easton, Allentown, Mauch Chunk and Belvidere.

4.30 P. M.—For Somerville.

5.00 P. M.—CINCINNATI EXPRESS.—For Easton, Bethlehem, Allentown, Reading, Harrisburg, Pittsburgh, Chicago and Cincinnati. Sleeping Cars to Pittsburgh and Chicago. Connects at Junction with Delaware. Lackawanna and Western Railroad for all Stations to Scranton.

5.25 P. M.—For Somerville and Flemington.

6 P. M.—For Easton and intermediate stations.

7.00 P. M.—For Somerville.

8.00 P. M.—WESTERN EXPRESS TRAIN.—For Easton, Allentown, Reading, Harrisburg, Pittsburgh and the West—connects at Harrisburg with train for Williamsport, Erie, &c.

8.10 P. M.—EMIGRANT—Stopping only at principal stations.

9.00 P. M.—For Plainfield.

11.45 P. M.—For Plainfield on Wednesdays and Saturdays only.

Sleeping cars through from Jersey City to Pittsburgh every evening.

Trains leave for Elizabeth at 5.45, 6.30, 6.55, 7,15, 8.15, 8.30, 9.00, 9.20, 10.30, 11.40 A. M., 12.00 M., 1.00, 2.00, 3.00, 3.30, 3.45, 4.15, 4.30, 4.45, 5.10, 5.25, 5.45, 6.00, 6.25, 7.00, 7.45, 8.00, 8.10, 9.00, 9.45, 10 45, 11.50 P. M.

Tickets for the West can be obtained at the office of the Central Railroad of New Jersey, foot of Liberty street, N. Y.; at No. 1 Astor House; Nos. 254, 271, 526 Broadway; at No. 10 Greenwich street, and at the principal hotels. R. E. RICKER, Superintendent.

H. P. BALDWIN, Gen. Pass. Agent.

RAILROADS.

MORRIS AND ESSEX RAILROAD.

—DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO. (Lessees). Depots in New York, foot of Barclay street and foot of Christopher street.

Summer arrangements, commencing MONDAY, May 10, 1869.

8.00 A. M.—MAIL TRAIN.—Connecting at Denville with Boonton Branch, at Dover with Chester Branch, at Waterloo with the Sussex Railroad for Andover and Newton, at Washington with the D. L. and W. Railroad for Water Gap, Stroudsburg, Scranton, and Great Bend, and all points on the Lackawanna and Bloomsburg, and Delaware and Hudson River Railroad; at Easton with the Lehigh and Susquehanna Railroad for Bethlehem, Allentown, Mauch Chunk, and Wilkesbarre.

11.30 A. M.—LEHIGH VALLEY EXPRESS—Stops at Newark, Morristown, Dover, Hackettstown, Washington, Phillipsburg, and Easton; connects at Phillipsburg with Bel., Del. Railroad for Belvidere, &c., and at Easton with L. V. R. R. for Bethelehem, Allentown, Mauch Chunk, and Wilkesbarre.

4.00 P. M.—SCRANTON EXPRESS—Connects at Washington with the D. L. & W. R. R. for Water Gap, Stroudsburg, and Scranton at Dover with Chester Railroad, and at Waterloo with Sussex Railroad.

6.30 A. M. and 4.30 P. M.—To Summit and intermediate stations.

6.30, 7.30, 9,30 A. M., and 1.00, 3.40, 5.30, 8.45, 11.45 P. M.—To South Orange and intermediate stations.

11.40 A. M., 3.00 and 6.30 P. M.—To Morristown and intermediate stations.

5.10 P. M.—Morristown Express.

For Newark at 6.30, 7.30, 8.00, 8.30, 9.30, 10.30, 11.00, 11.30, 11.40, A. M., 1.00, 2.00, 3.00, 3.30, 3.40, 3.50, 4.00, 4.30, 5.00, 5.10, 6.10, 6.30, 7.45, 8.45, and 11.45 P. M.

For Bloomfield and Montclair—At 8 30, 11.00 A. M.; 2.00, 3.50, 5,00 and 6.10 P. M.

S. SCHOCH, Assistant Superintendent,
R. A. HENRY, G. P. Agent.

NEW JERSEY RAILROAD—For PHILADELPHIA.

Via Kensington, *6.30 p. m.; on Sundays, via West Philadelphia.

Via Camden, 1 p. m. and 4 p. m.

Via West Philadelphia, 7 a. m., 8.40 a. m., 10 a. m., 12.30 p. m., 5 p. m., *9 p. m., 9.20 p. m., and 12 night.

For Baltimore and Washington—8.40 a. m., 12.30 p. m., *9.26 p. m.

For South and Southwest—8.40 a. m., and *9.20 p. m.

FOR THE WEST.

8.40 a. m., 12.30 p. m., 5 p. m., *9 p. m., and *9.20 p. m.

The 8.40 a. m., and *9 p. m. trains through, with but one change, to Cincinnati and Chicago.

Silver Palace Sleeping Cars attached to the 5 p. m. train run through to Cincinnati and Chicago without change, daily, (Saturdays and Sundays excepted); and on those days to the 9 p. m. train. This is the only line running through cars to Chicago by evening lines.

TICKET OFFICE FOOT OF CORTLANDT ST.

Tickets for sale in Reclining Chair cars can be obtained at foot of Courtland street and 944 Broadway.

May 10th, 1869. F. W. JACKSON,
*Daily. General Superintendent.

STEAMBOATS.

FOR BOSTON
VIA
FALL RIVER DIRECT.
The world-renowned steamers
BRISTOL AND PROVIDENCE,
Commander BRAYTON, Commander SIMMONS.
will leave (alternate days) DAILY
From Pier No. 30 North River,
foot of Chambers-st.,
AT FIVE P. M.
DODWORTH'S CELEBRATED ORCHESTRA.
GRAND PROMENADE CONCERT EVERY EVENING.
This is the only line running a
SUNDAY NIGHT BOAT.

To better accommodate the public the splendid steamers
NEWPORT AND OLD COLONY.
Commander LEWIS, Commander MILLER,
will leave (alternate days) DAILY
(Sundays excepted)
from Pier No. 28 North River,
(foot of Murray-st.,)
AT 6 P. M., FOR BOSTON VIA NEWPORT.
FREIGHT received at Pier No. 30 up to 5 P. M.
and at Pier No. 28 up to 6 P. M. each evening.
JAMES FISK, Jr., President.
M. R. SIMMONS, Managing Director,
CHAS. H. VAILE, General Passenger Agent,
H. H. MANGAM, Freight Agent.
Narragansett Steamship Company.

PEOPLE'S LINE FOR ALBANY.—THE largest and most magnificent river steamers in the world—The ST. JOHN, DREW and DEAN RICHMOND.

One of the above steamers will leave Pier No. 41, North River, EVERY AFTERNOON (Sundays excepted) at 6 o'clock, arriving at Albany in time to connect with railroad trains West and North. Returning, leave the Albany Steamboat Landing at 7 o'clock P. M., or on the arrival of connecting trains from the West and North. Through tickets can be obtained at the office on the wharf, and baggage checked to its destination. Freight received until the hour of departure.

TROY LINE FOR ALBANY AND TROY. The fastest, elegant evening river steamboats in the world. The
VANDERBILT and CONNECTICUT
leaves Pier No. 44 North River, foot of Spring street,
EVERY EVENING,
Saturdays excepted, at 6 o'clock, and foot of West 34th street at 6:15. Fare only $1 50, being $1 75 less than rail and 75c. cheaper than any other route, and like reduction to Buffalo, Niagara Falls, all points West, to Saratoga, Sharon, Lake George, all points on Lake Champlain, to all points in Vermont and Western Massachusetts. Tickets sold and state-rooms secured at Dodd's Express Offices, Nos. 429 and 944 Broadway, New York, and No. 1 Court street, Brooklyn. Also at No. 308 West street, above Spring street. Passengers landed in Saratoga in time for breakfast.

STONINGTON LINE—TO BOSTON AND PROVIDENCE.

GREAT INSIDE ROUTE—SHORTEST AND MOST DIRECT.
Fare always as low as by any other line.

The new and elegant side-wheel steamers
STONINGTON and NARRAGANSETT.
Capt. WM. M. JONES. Capt. GEO. B. HULL.
From Pier No. 33, foot of Jay st., North River,
at 5 p. m.,
Arriving ahead of all other lines.
Tickets sold and state-rooms secured at No. 2 Astor House, and at Dodd's Express office, No. 944 Broadway.
D. S. BABCOCK,
President Stonington Steamboat Company.

ALBANY AND TROY DAY LINE.—CHANGE OF TIME.
The steamboats
C. VIBBARD and DANIEL DREW
will, on and after THURSDAY, July 8, leave Desbrosses street at 8, and 34th street at 8:15, landing at Yonkers, West Point, Cornwall, Newburg, Poughkeepsie, Tivoli, Rhinebeck, Catskill and Hudson. Tickets sold and baggage checked on board the boats to all points on New York Central and Rensselaer and Saratoga Railroads.

PUBLICATIONS.

THE MINES OF COLORADO:

BY CVANDO J. HOLLISTER.
LATE EDITOR AND PROPRIETOR OF
"THE COLORADO MINING JOURNAL."

The approaching completion of two lines of railway between the Mississippi Valley and the Rocky Mountains, will mark an era in the history of the nearer of the mining Territories—Colorado. It will infuse new life into mining, by giving safe, quick, and reliable communication, reducing freights and risks, thus cheapening supplies and furnishing a most necessary competition in the labor market, under which the production of the precious metals will be largely increased, and the value and importance of property of all kinds will be proportionally enhanced. This cannot fail to arrest the attention of capitalists who are interested in Colorado gold and silver stocks, or are thinking of becoming so. It will be of yet more benefit to that large class whose capital is their muscle, because it will make accessible to them a new and large tract of virgin land, which, though far West, is still on the World's great highway, and therefore in no sense of the word in the backwoods. This region has a pleasant and healthy climate, and while its soil is unsurpassed in strength by that of the prairie States, it has a superior market in the adjoining mines. It most eloquently invites settlement and improvement. It will also give the Summer tourist a choice between the West and the East. It is not hazarding much to say that the Rocky Mountains offer the most delightful Summer resort of the New if not of the Old World. The climate is cool and bracing, the air deliciously pure and soft, the scenery both grand and beautiful, the forests full of game and the streams of trout, with hot mineral springs of high medicinal value boiling up at the root of every shade tree in the sequestered parks. The annexation of the Rocky Mountains to the Union by railways will open a new world to science, a new field of adventure to money and muscle, a new and pleasant place of Summer resort to people of leisure.

To meet the growing want of definite information concerning that interesting country, this book is put forth. It treats of the discovery of gold and settlement of the country, its geography, chorography, geology mineralogy, and agriculture, its early efforts at self government, and the progress and present condition of mining industry, including descriptive list of mining companies, principal improved mines, mills, machinery, and methods of treating ore—in short, it undertakes to give, as concisely and precisely as possible, and without any pretension, all that is known on the subject.

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THE success which has attended our efforts to provide a first-class Monthly, devoted to the interests of the industrial classes, has far exceeded our most sanguine anticipations. THE MANUFACTURER AND BUILDER has been received with favor by every class of the community. Manufacturers have taken it for the information which it gives in regard to the improved processes in which they are interested; mechanics have taken it for the instruction which it conveys in regard to matters pertaining to special arts and trades; professional and literary men have taken it for the information which it conveys in regard to the progress of the industrial arts; people, in general, have taken it because it contains much pleasant reading matter for the family circle. That all these classes have been right in their estimate of this journal, will be evident to any one who will read the Table of Contents which we here append. When we state that these articles are almost all derived from original and authoritative sources, it will be seen that we have presented a body of **PRACTICAL, THOROUGH, AND RELIABLE INFORMATION,** such as can nowhere else be obtained for the sum charged for a year's subscription to THE MANUFACTURER AND BUILDER.

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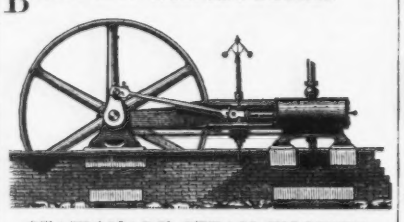

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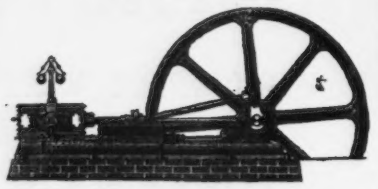

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